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40 Cent Minimum Wage For Paper Industry

Order Is Issued By Col. Philip B. Fleming To Be Effective Sept. 16, 1940 — Application of the New Law To the Industry Will Increase the Hourly Wage Rate of More Than 8,000 Wage Earners.

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., July 24, 1940—A wage order calling for payment of at least 40 cents an hour in the manufacture of pulp and primary paper, effective September 16, 1940, was issued today by Colonel Philip B. Fleming, Administrator of the Wage and Hour Division, United States Department of Labor. The 40 cents-an-hour minimum was recommended by a committee, comprised equally of representatives of the public, employers, and employees under the chairmanship of John A. Lapp of Chicago, which investigated the economy of the industry.

Application of the 40 cent minimum wage to the industry as defined will increase the hourly wage rates of more than 8,000 wage earners. The total number of employees in the industry is about 150,000. The industry is carried on in 841 establishments in the north and south and on both coasts, and its annual value of product is $1,000,000,000.

At the same time Colonel Fleming issued his Findings and Opinion based on the record of a public hearing on the recommendation held in Washington on May 20 and 21, 1940.

Complete findings and opinion of the administrator in the case are as follows:—

This is a proceeding for the purpose of determining whether the 40 cent minimum wage recommendation of Industry Committee No. 11 for the Pulp and Primary Paper Industry shall be approved and carried into effect.

On February 16, 1940, pursuant to Section 5(b) of the Fair Labor Standards Act of 1938, herein called the Act, I appointed, by Administrative Order No. 41, Industry Committee No. 11, herein called the Committee, to recommend, after investigation, the minimum wage rates to be fixed for the Pulp and Primary Paper Industry. The Committee met in executive session from March 18, to March 22, 1940, inclusive. Numerous witnesses were heard on the factors which the Committee is required to take into consideration by the terms of the Act. On March 22, 1940, the Committee, by a majority vote of 10 to 8, recommended that the minimum wage rate in the industry be 40 cents an hour.[2] The majority report of the Committee, containing its recommendation, was duly filed with me on April 11, 1940, pursuant to Section 8(d) of the Act, and on April 15, 1940, a minority report was filed.[3] On April 24, 1940, pursuant to the provisions of Section 8(d) of the Act, I gave due notice of a hearing to be held in this proceeding in Washington, D. C., before Presiding Officer Henry T. Hunt, Esq., Principal Hearings Examiner.[4] The hearing was held on May 20, and May 21, 1940. The complete record of the hearing before the Presiding Officer was thereupon transmitted to me. All parties who appeared at the hearing were notified that written briefs would be received until June 10, 1940.[5] On June 10, 1940, pursuant to notice published in the Federal Register and duly served upon all parties, oral argument was had before me in Washington, D. C.[6]

During the course of the hearing, the Presiding Officer made a number of rulings on motions and on objections to the admission of evidence. I have reviewed the rulings of the Presiding Officer, and, save for those rulings which are inconsistent with the findings, conclusions and order set forth below, hereby affirm said rulings.

I have reviewed, considered and appraised the entire record of this proceeding, heard oral argument, read the briefs submitted, and consulted with subordinates who have reviewed and analyzed the record, the oral arguments, and the briefs. Upon all the evidence, I make the following findings, conclusions and order:

[1] For the benefit of the reader, footnotes in this opinion make reference to certain relevant portions of the record. These findings, however, are based upon the entire record and are not based solely upon the portions cited.

[2] Those voting in opposition to the recommendation of a 40 cent minimum were all the employer members of the Committee and Henry A. Grady and Arthur D. Hill, Sr., public members of the Committee Administrator's Exhibit 10.

[3] Administrator's Exhibit 1-G. Dissenting statements were also filed by Henry A. Grady and Arthur D. Hill, Sr., and included in this exhibit.

[4] Administrator's Exhibit 1-I.

[5] Briefs were filed by the Insulation Board Institute and the American Paper and Pulp Association.

[6] Oral argument was presented by Mr. Merrill A. Russell, appearing in behalf of the Insulation Board Institute and the U. S. Gypsum Company, and Mr. Boris Shishkin, representing the American Federation of Labor.

(Continued on page 10)

Menasha to Establish Branch Box Plant

Equipment To Be Installed About September 1 In Plant Leased By Menasha Wooden Ware Corp. At Durham, N. C., To Produce Corrugated Boxes—Kimberly-Clark Mill Near Completion—Mill Employment Up.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., July 22, 1940—Establishment of a branch plant in Durham, N. C. to manufacture corrugated boxes has been announced by the Menasha Wooden Ware Corporation, Menasha, Wis. It will be known as the company's Southern Division. With the decline in demand for wooden containers, the company has been operating a corrugated box plant in Menasha for a number of years, and is establishing the branch to supply the southern market.

A five-year lease with an option for renewal has been taken by the company on a plant at Durham. It is being renovated for the installation of box machinery, and the equipment is to be delivered about September 1. It is hoped operations will be started within two weeks after that time and when at capacity, the plant will employ 50 men, according to Donald Shepard, vice-president. Eventually, the company hopes to put in machinery to make the corrugated paper right at the plant.

To Become Managing Personnel

Four employees will be transferred from the Menasha plant to Durham to become the managing personnel. They are J. F. Burnham, sales representative, who will become plant manager; Roman Suess, office manager and cost accountant; Oscar Smith, in charge of the Menasha plant for the last nine years, as superintendent, and Tom Young, to be in charge of the designing department.

Mr. Shepard and George Hinton, box plant executive, have been spending some time at Durham planning the plant and arranging for the installation of equipment. Mr. Burnham will leave about August 15 to direct the installation.

New Kimberly-Clark Mill Nearly Finished

Construction of the Kimberly-Clark Corporation's new mill at Neenah, Wis. will be completed about August 15, according to present estimates. The steel work, using more than 720 tons, has been put in place, and the concrete floors have been built. Workmen are now building the exterior walls of face brick.

The structure is 235 by 82 feet in size and 70 feet high, and has three stories. It will be used for the manufacture of coarse crepe wadding out of which a new insulation product will be made, to be placed on the market late in the fall. The entire basement will be used for storage, and the two upper floors will house machinery for manufacture. Construction has been under way for four months. The Siesel Construction Company, Milwaukee, Wis., has the contract.

Neenah Co. Receives Government Order

The Neenah Paper Company, Neenah, Wis., will share in two large government orders for paper, according to contracts executed last week. One of these is a $290,346.30 indefinite order, purchases to be made as needed, under a contract awarded to Barton, Duer and Koch Paper Company, Washington, D. C. The other is an indefinite order placed with the Peninsular Paper Company, Ypsilanti, Mich. under a contract awarded the Marquette Paper Company, Chicago.

Joseph Auchter Has Resigned

The resignation was announced last week of Joseph A. Auchter, vice-president, treasurer and a director of the Nekoosa-Edwards Paper Company, Port Edwards, Wis. The resignation is to take effect immediately.

Mr. Auchter joined the organization September 24, 1934, coming from the Milwaukee Company, Milwaukee, Wis., where he was an executive for a number of years. He has made no announcement of his future plans except to say that he has pending several negotiations, one of which may be consummated within a few days. While at Port Edwards he was active in community affairs, was a director of the Wood County Bank and president of the Bull's Eye Country Club.

Mr. Auchter's resignation came just prior to the annual meeting of the stockholders and directors on Wednesday, July 17. Guy O. Babcock, president of the Wood County National Bank, was elected to succeed him, but his affiliation with the company will have no bearing on his active affiliation with the bank. C. A. Jasperson, secretary of the company, was elected secretary-treasurer. John E. Alexander was reelected president and general manager, and Harry Deyo was elected assistant secretary. All of the remaining directors were reelected, including: L. M. Hanks, Madison, Wis.; A. S. Puelicher, Milwaukee, Wis.; Judson G. Rosebush, Appleton, Wis., and J. B. Nash, Wisconsin Rapids, Wis.

Paper Industry Employment Gains

Gains in employment and weekly payrolls in Wisconsin were reflected particularly in the paper industry, according to reports issued by the Wisconsin Industrial Commission for the month of June. The commission reported that the paper and pulp industry has reached an all-time employment record, with 22,900 wage earners on the payrolls. The increase for the state was 1.9 per cent, and payrolls were up 2.5 per cent.

F. J. Sensenbrenner Re-Elected

F. J. Sensenbrenner, president of Kimberly-Clark Corporation, Neenah, Wis., was reelected a member of the board of trustees of the Northwestern Mutual Life Insurance Company of Milwaukee, Wis., at the general election of the company at Milwaukee Wednesday of last week. He will serve a four-year term. Mr. Sensenbrenner also has been appointed chairman of a state-wide finance committee to raise funds for the Republican party's presidential and state and local campaigns. He outlined his plans at a meeting of party leaders at Milwaukee last week.

Canada's Newsprint and Pulp Trade Active

Sharp Increases In Newsprint and Pulp Follow Suspension of Wood Pulp Shipments From Scandinavia — June Shipments Rise To 96 Per Cent of Capacity With Increased Sales To U. S. A.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., July 22, 1940—A Canadian Press despatch from Ottawa, quotes an official of the Department of Trade and Commerce as stating that Canada's newsprint and wood pulp industry, after several tough years has come around to robust health as a result of the European conflict, giving the blockade of the Scandinavian trade routes as the reason for sharp increases in sales of these commodities.

Canada Widens Export Markets

"Scandinavian countries, particularly Sweden and Finland, did a large newsprint trade with South America and sold large quantities of wood pulp to the United States," the official said. "Canada has taken over much of these markets."

Exports to the United Kingdom have increased for the same reason, he added.

For the past few years, Canada has led the world in newsprint exports. June exports of this product were 6,413,000 hundredweight, valued at $15,168,000, compared with 4,893,000 hundredweight valued at $10,680,000 in June, 1939.

Last month's figure was the third highest in the industry's history.

During the six months ended June 30, 1940, exports amounted to 30,103,000 hundredweight, worth $68,560,000 compared with 24,302,000 hundredweight, worth $56,526,000 during the same period of 1939.

June shipments represented 96.1 per cent of capacity, compared with 87.9 per cent in May and 64.1 per cent the same month last year. Expansion in last month's shipments was mainly to the United States, which alone took 5,067,800 hundredweight.

Wood pulp exports have risen even more abruptly and for the same reason.

During June Canada shipped 2,119,000 hundredweight of wood pulp valued at $786,000 compared with 849,000 hundredweight valued at $1,925,000. Figures for the first six months of 1940 were 10,184,000 hundredweight ($26,569,000) against 5,534,000 hundredweight ($12,937,000) for the same period last year.

With respect to his reference to exports to the United Kingdom having increased, it may be mentioned that there has been a remarkable change in the shipping situation, plenty of ships now being available for forest products not only in newsprint and pulp now moving abroad, but large shipments of timber, both from the east and west coasts. This has created quite a boom in the lumber business, it being explained that the British victory over the submarine, plus new British ships and the acquisition of foreign cargo space have made this possible.

George W. Gair Dead

George West Gair, chairman of the board of the Robert Gair Company, 155 East 44th Street, New York, with which he had been associated fifty-four years, died July 21 of pneumonia at Gairellen, his home at Westport, Conn., on July 21, after an illness of three weeks. His health had been poor for three years. He was 68 years old.

Born in Jersey City, N. J., a son of Robert and Emma Eyre Gair, Mr. Gair entered the employ of his father's company at 14. He was made vice president in 1903 and president in 1920. To the presidency he added the chairmanship of the board in 1927, but since 1931 he had held only the latter position. The Gair Company owns twenty-nine paper mills in the United States and Canada.

Mr. Gair was also president of the Gair Realty Corporation and of the Gair Investment Corporation and since 1921 had been chairman of the Westport Board of Finance. He belonged to the Military Order of the Loyal Legion, St. Andrew's Society and the New York Yacht Club.

Mr. Gair leaves a widow, who was Helen Fitz-Maurice at their marriage in 1910; a son, George W. Gair Jr., who recently joined the United States Flying Corps and is stationed at Honolulu, H. I., and three sisters, Dr. E. Florence Gair and Miss Elizabeth Gair of New York and Mrs. William A. Gill of Southampton, L. I.

Builds Paper Mill in Philippines

The Compania De Celulosa De Filipinas, Inc., is erecting a pulp and paper mill in Bais, Negros Oriental adjoining the Central Azucarera de Bais, which will provide them with its excess sugar cane bagasse, the raw material from which they will produce cellulose in their pulp factory. The company will use the Pomilio Process which consists chiefly in the treatment of bagasse with chlorine gas and caustic soda in continuous towers and apparatus. The pulp and paper factories will be finished before the end of the year and it is intended to start producing pulp and paper immediately. The pulp will be used chiefly in the company's paper mill and a small quantity will be exported. A cardboard mill is also being erected in which the rejects from the filters and sand tables of the cellulose plant will be used.

The mill is equipped with two 1200-pound beaters, one pony monarch jordan, three washers, one 92-inch wet machine and one 92-inch Fourdrinier, widest trim sheet 80 inches. It is said that the Fourdrinier will have a speed up to 500 feet per minute and the company will be able to make with it, machine finished bond, book writing and wrapping papers, also bag and wrapping papers with machine glazed finish, minimum weight of sheet 15 lbs. (24 x 36—500).

The officers of the company are as follows: Adrian Got, president; Charles H. Davies, vice-president; Jesus Zabaljauregui, secretary; Ignacio Planas, treasurer; Cia. Gral. de Tabacos de Filipinas, general manager and Purchasing Agent; Fermin de Urmeneta, superintendent; Ramon Barata, technical director and Miquel A. Rosales, chief chemist.

The main office of the company is at Manila, Philippine Islands.

40 CENT MINIMUM WAGE FOR PAPER INDUSTRY

(Continued from page 7)

I. Definition of the Pulp and Primary Paper Industry

Administrative Order No. 41, of February 16, 1940, which appointed the Committee, contained a definition of the Pulp and Primary Paper Industry. The definition was made by me after consultation with employers and representatives of labor in the industry and upon the basis of an investigation conducted by the Industry Committee Branch and supplemented by the advisory assistance of the Economic Section and Legal Branch of the Wage and Hour Division of the Department of Labor.

The Pulp and Primary Paper Industry is defined as follows:

> "For the purpose of this order the term 'pulp and primary paper industry' means the manufacture of pulp, for any purpose, from fibrous material capable of yielding cellulose fibre and the manufacture of paper and of board from such pulp and from such fibrous material or either of them with or without addition of any non-cellulose fibre, colorant or filler.
>
> "The term 'manufacture' as used in this order means all operations involved in the production of pulp, paper, and board, starting with the unloading of raw materials at the mill site and ending with the delivery of the finished paper or board to carriers for sale as such or to converting departments within the same mill or company. It includes finishing operations normally performed in the paper or board mill, such as packing, trimming, cutting to size, sorting plating, sizing, supercalendering, and other processing, but does not include any treating, processing or refabrication of finished paper or board to produce converted paper or board products."

Merrill A. Russell, appearing in behalf of the Insulation Board Institute, an association of insulation board manufacturers, and United States Gypsum Company, contended that the manufacture of insulation board should be excluded from the coverage of the definition.

Upon consideration of the history of the definition, the evidence concerning the nature and use of insulation board, the processes involved in its manufacture, and the competitive conditions of insulation board manufacturers,[7] it is my view that the term "board" as used in the definition of the Pulp and Primary Paper Industry is not intended to include insulation board. Accordingly, I find that the Pulp and Primary Paper Industry as defined does not include the manufacture of insulation board.

Utilized in the manufacture of insulation board is pulp manufactured "from fibrous material capable of yielding cellulose fiber." Although the evidence establishes that such pulp is of a coarser quality than that manufactured for use in paper, is manufactured by insulation board mills for use only in insulation board of a particular mill, and is manufactured commonly on modified pulp making machines, frequently employing a cruder type of raw material,[8] nevertheless, the product is clearly pulp as that term is used and its manufacture is within the definition. Accordingly, I find that the definition of the Pulp and Primary Paper Industry includes all operations involved in the production of pulp for manufacture into insulation board. Upon all the evidence, I find that the definition of the Pulp and Primary Paper Industry as contained in Administrative Order No. 41, is appropriate and reasonable.

II. Selection of Membership in Industry Committee No. 11

Pursuant to Section 5(b) of the Act there was appointed by Administrative Order No. 41, dated February 16, 1940, six persons representing the public, six representing employers in the industry, and six representing employees in the industry. The persons appointed to the Committee are as follows:

Public representatives: John A. Lapp, Chairman, Chicago, Ill.; Wayne Lyman Morse, Eugene, Ore.; Sumner Huber Slichter, Cambridge, Mass.[9]; William John Wilgus, Washington, D. C.; Henry A. Grady, New Bern, N. C.; Mrs. Elizabeth Brandeis Raushenbush, Madison, Wis.

Employer representatives: J. D. Zellerbach, San Francisco, Cal.[10]; Dwight Stocker, Plainwell, Mich.; Stuart E. Kay, New York, N. Y.; W. J. Alford, Jr., Ridgefield Park, N. J.; L. J. Parant, Woodland, Maine; Alan G. Goldsmith, Chillicothe, Ohio.

Employee representatives: H. W. Sullivan, Washington, D. C.; Frank P. Barry, Albany, N. Y.; Charles O. Dunton, Rumford, Maine; Maxwell Loomis, Port Townsend, Wash.; Paul Phillips, Mobile, Ala.; Ray Thomason, Richmond, Va.

No contention was made that the Committee was not selected in accordance with the requirements of the Act. Nevertheless, and, although it is my view that the question of the selection of the Committee is not before me, the evidence relating to the geographical locations in which the Pulp and Primary Paper Industry is concentrated shows that each group of the Committee was appointed with due regard to the geographical regions in which the industry is carried on,[11] I, therefore, find that the selection of the Committee was made in accordance with the provisions of Section 5(b) of the Act.

III. Effect of the Recommended Minimum on Employment in the Industry

The objective of the Act, and particularly Section 8 thereof, is to reach "as rapidly as is economically feasible without substantially curtailing employment . . . a universal minimum of 40 cents an hour in each industry engaged in commerce or in the production of goods for commerce . . ."[12] The Committee's report concluded that the adoption of a 40 cent minimum will not, having due regard to economic and competitive conditions, substantially curtail employment in the industry. The Committee therefore recommended a 40 cent minimum. At the hearing before the Presiding Officer, experts presented evi-

[7] See testimony of Mr. Shaw, R. p. 148 *et seq.*; Statement of Mr. Russell, R. p. 269 *et seq.*; testimony of Mr. J. R. Newberry in behalf of U. S. Gypsum Company, R. p. 273 *et seq.*; Insulation Board Institute and U. S. Gypsum Company Exhibits A, B, C, D, E, and F.

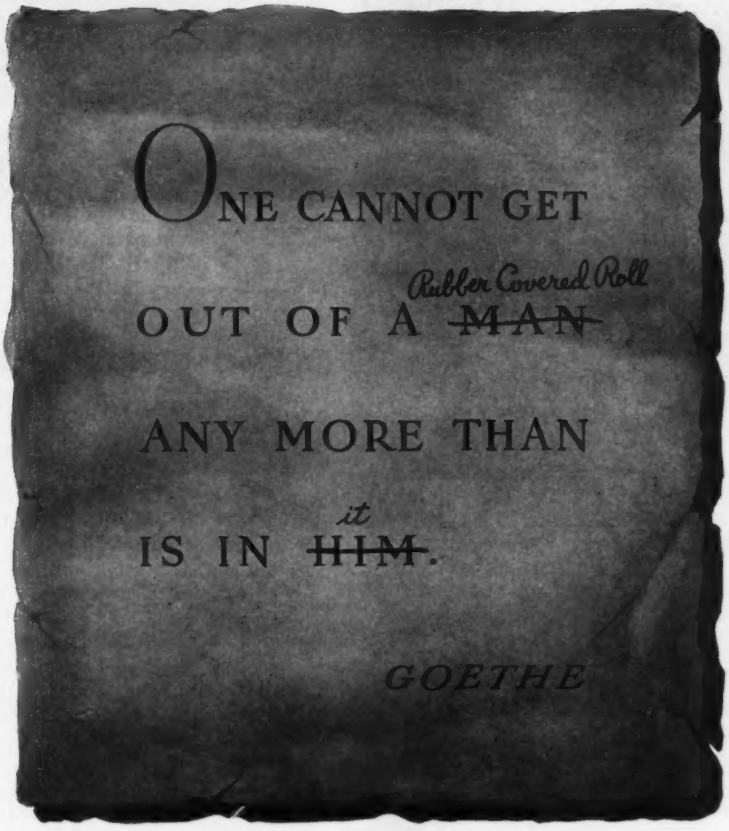
[8] See testimony of Mr. Newberry, R. p. 273 *et seq.*

[9] Mr. Slichter resigned from the Committee. Arthur D. Hill, Sr., Esq., of Boston, Mass., was appointed to the Committee on March 4, 1940, in his stead. Administrator's Exhibit 1-B.

[10] Mr. Zellerbach resigned from the Committee. Mr. A. R. Heron, of San Francisco, California was appointed to the Committee on March 13, 1940, in his stead. Administrator's Exhibit 1-C.

[11] See Administrator's Exhibit 8, Table 10, pp. 72-73.

[12] Fair Labor Standards Act, Section 8(a).



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dence relating to the industry and its wage structure, earnings and hours in the industry, living and transportation costs, and the estimated effect of a 40 cent minimum on labor costs, operating costs, consumer prices, demand and employment.[13] This and other evidence concerning the recommendation will be analyzed.

A. Aggregate Employment in the Pulp and Primary Paper Industry.

In order to ascertain the existing wage structure of the industry, the Bureau of Labor Statistics, at the request of the Economic Section of the Wage and Hour Division, studied a sample comprising approximately 50 per cent of the 841 pulp, primary paper, and paperboard establishments in the industry.[14]

The Economic Section of the Wage and Hour Division prepared a study for the Committee from the surveys made by the Bureau of Labor Statistics and it was placed in evidence at the hearing before the Presiding Officer.[15] This study shows that a 40 cent minimum would result in a direct increase in the total wage bill of the industry of approximately 0.48 per cent.[16] Labor costs for all products in the industry represent from 17.1 per cent to 22.2 per cent of the operating costs.[17] Thus, the establishment of a 40 cent minimum wage, based upon the maximum ratio of labor costs to operating costs, would result in an increase in operating costs of approximately 0.10 per cent.[18]

This same study prepared by the Economic Section and received in evidence at the hearing indicates that an average of approximately 6171 or 6.4 per cent of all the wage earners employed in pulp and primary paper mills as of October 1938 were receiving less than 40 cents an hour.[19] In paper board mills, 2254 or 6.9 per cent of the wage earners received less than 40 cents an hour in November and December 1939.[20] Wage earners receiving less than 40 cents an hour have average hourly earnings substantially below the average for the industry.[21] The majority of the workers, however, whose wages will be increased are employed in firms paying average hourly wages well above 40 cents.[22] The increase in the operating costs of such firms, which cannot be considered low-wage establishments, resulting from increasing the wages of those workers to 40 cents an hour will be negligible.

It was contended at the hearing before the Presiding Officer that the establishment of a 40 cent minimum would indirectly affect the entire wage structure of the industry by increasing the wages of those workers already earning more than the recommended minimum.[23] There was a conflict among witnesses in their testimony concerning the effect of a 40 cent minimum on wages in excess of the minimum.[24] The evidence establishes, however, that increases to workers receiving in excess of a 40 cent minimum depend upon a number of variable factors[25] and occur only with respect to those workers receiving wages close to the minimum.[26] Since only 17.9 per cent of the pulp and paper workers and 19.9 per cent of the paper board workers comprise the group receiving wages close to the minimum, that is, ranging from 40 cents to 50 cents an hour,[27] the estimated direct increase of 0.10 per cent in the operating costs will be only slightly augmented by increases to wage earners receiving above the minimum.[28] In view of the many factors upon which such wage increases depend and inasmuch as there is no legal compulsion to increase wages above the recommended minimum, it may reasonably be anticipated that such increases will not be made if the consequence would result in cessation or curtailment of operations. Accordingly, upon all the evidence, I find that the indirect effect of the recommended minimum upon workers already earning in excess of 40 cents will not cause any substantial increase in operating costs in the Pulp and Primary Paper Industry.

Opponents of the proposed minimum wage rate contended further that the establishment of a 40 cent minimum would also require integrated mills to increase the wages of workers employed in converting departments, despite the fact that converting departments are not within the scope of the definition.[29]

[13] Administrator's Exhibits 2-27 (inclusive).

[14] The survey of the pulp and primary paper establishments was prepared upon the basis of 457 returns made to questionnaires submitted by the American Paper and Pulp Association to 470 companies representing 598 mills. See Cancell Exhibits 1 to 3-B inclusive; R. pp. 14-23. The survey of paperboard establishments was conducted by the Bureau of Labor Statistics and covered 143 establishments, employing 16,332 wage earners representing approximately 50 percent of the wage earners in the industry. Administrator's Exhibit 3; R. pp. 32-34.

[15] Administrator's Exhibit 9.

[16] This estimate is derived from the results of the American Paper and Pulp Association, *Wage Rate Survey of 1938*, and the U. S. Bureau of Labor Statistics survey, *Hourly Earnings in the Paperboard Industry*, November and December, 1939. The estimated percentage increase in the wage bill of pulp and paper plants resulting from the establishment of a 40 cent minimum is 0.44 percent, and for paperboard plants, 0.47 percent. Administrator's Exhibit 9, Table 16, p. 35.

[17] Administrator's Exhibit 9, Table 36, p. 71.

[18] Administrator's Exhibit 9, Table 36, p. 71.

[19] *Ibid*, Table 25, p. 53.

[20] *Ibid*, Table 26, p. 55.

[21] The annual average wage for the entire industry for 1938 and 1939 was 61.9 cents. *Ibid*, pp. 27-28. Of the 6171 wage earners receiving less than 40 cents an hour in pulp and paper establishments in October 1938, 771 received under 32 cents, 1543 under 34 cents, 1832 under 35 cents, 3085 under 37 cents, and 4821 under 39 cents. Of the 2254 wage earners receiving less than 40 cents an hour in paper board establishments in November and December 1939, 229 received under 32 cents, 294 under 34 cents, 327 under 35 cents, 1307 under 37 cents, and 2090 under 39 cents. *Ibid*, Tables 25 and 26, pp. 53, 55.

[22] Of the 296 pulp and paper plants in the sample, only 43 showed average hourly earnings of less than 50 cents. Three of these plants averaged under 40 cents, 10 averaged 40 to 45 cents, and 30 averaged 45 to 50 cents. Administrator's Exhibit 2. Of the 134 paperboard plants in the survey, 31 paid an average of less than 50 cents an hour. Administrator's Exhibit 9, p. 38. Thirteen of these plants averaged under 45 cents and 18 averaged between 45 cents and 50 cents. Administrator's Exhibit 3, Table 4, p. 12.

In the pulp and paper plants, the largest proportions of workers receiving under 40 cents are found in groups of plants averaging from 45 cents to 60 cents an hour. In the paperboard division, the largest proportion of workers receiving under 40 cents an hour are found in plants averaging under 45 cents an hour. Administrator's Exhibit 9, Tables 17 and 18, pp. 38-40. Of the 6171 pulp and paper workers receiving under 40 cents, 1201 are in plants having an average hourly wage of from 45 to 50 cents, 1756 are in plants averaging from 50 to 55 cents, and 1687 are in plants averaging from 55 to 60 cents. Of the remainder, 1188 are in plants averaging under 45 cents, and the balance are in plants averaging more than 60 cents. Administrator's Exhibit 9, Table 17, p. 39. Of the 2254 paperboard workers, 1534 are employed in plants having average hourly earnings under 45 cents, 512 in plants averaging 45 to 50 cents, 100 in plants averaging 50 to 60 cents, and 140 in plants averaging 60 to 70 cents. Administrator's Exhibit 9, Table 18, p. 40.

[23] This contention was urged by E. W. Tinker, Executive Secretary of the American Paper and Pulp Association (R. p. 231, 242), Charles H. Robertson, in behalf of the Albermarle Paper Manufacturing Co., Richmond, Va. (R. pp. 253, 254, 255), and Harry C. Bradford, in behalf of Rex Paper Co., Kalamazoo, Michigan (2. p. 265, 266).

[24] W. H. Richardson, Vice-President of the Gardner-Richardson Company, Middletown, Ohio, testified that in his opinion there would be no increase in the total wage bill. (R. p. 88). E. W. Tinker testified that, on the basis of experience, an increase in the minimum wage resulted in increases above the minimum. (R. p. 231, 242).

[25] Experience in other industries indicates that the extent of increase to wage earners receiving above the minimum depends among other things upon the extent to which the minimum is raised in relation to the existing wage structure in an industry, upon whether mill policy demands the maintenance of occupational differentials, trade union policy, the policies of related or similarly located industries, and general business conditions. (R. p. 125 *et seq*); Administrator's Exhibit 9, pp. 65-69.

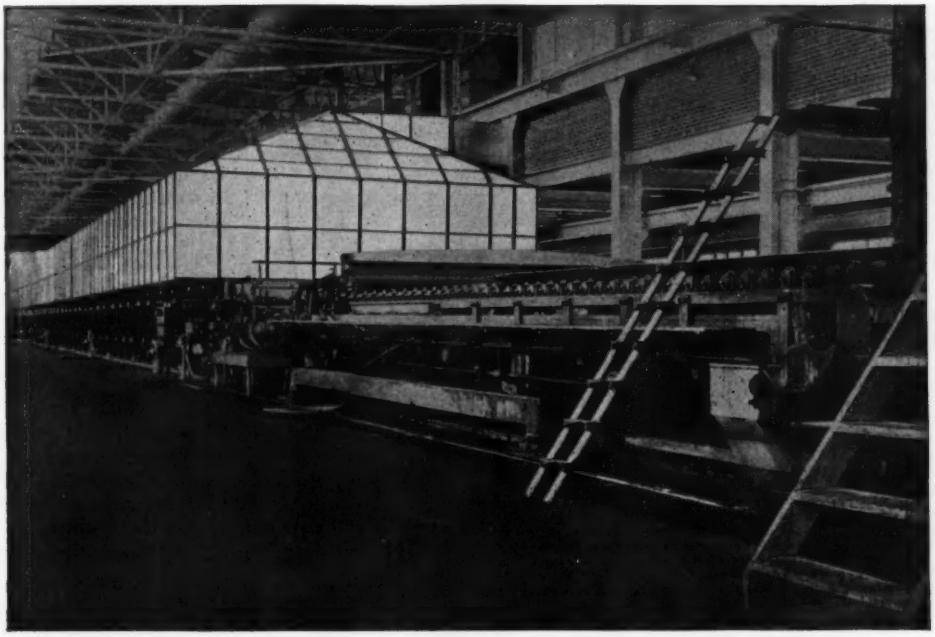
[26] *Idem.*

[27] Administrator's Exhibit 2, Table 2; Administrator's Exhibit 3, Table 3; R. p. 127.

[28] Even if the increase in the wages of those workers receiving in excess of a 40 cent minimum were to be as great as the direct increase, it is apparent that the increase in operating costs resulting from the establishment of a 40 cent minimum would be insignificant.

[29] See testimony of Harry C. Bradford, R. p. 265, 266, and testimony of E. W. Tinker, R. p. 236.

ANOTHER BELOIT MACHINE



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THE BELOIT WAY BELOIT IRON WORKS PAPER MACH'Y BELOIT, WIS. U.S.A. **IS THE MODERN WAY**

While it is my view that the question of the effect of a recommended minimum on employees in another industry is not properly before me, I have, nevertheless, considered the contention and find that no substantial curtailment of employment in converting departments of paper mills will result from the establishment of a 40 cent minimum for the Pulp and Primary Paper Industry.[30]

It is amply demonstrated in the record that the slight increase[31] resulting from the establishment of a 40 cent minimum may be absorbed without adversely effecting employment in the industry. The ability of the industry to absorb cost increases depends upon the relationship of operations to capacity, the degree of competition between the products of the industry and of other industries, the extent to which the industry must rely upon foreign trade and the trends of wholesale prices.[32] For example, the industry as a whole has operated below capacity.[33] An increase in operations will lower unit costs and increase profits,[34] thus permitting easier absorption of wage bill increases. Furthermore, a study of wholesale prices of pulp and primary paper products indicates wide fluctuations for some products and marked stability for others.[35] With reference to raw material prices, the consumption of wood pulp, the principal raw material used in the industry, was highest when the highest prices prevailed in the industry. It is therefore apparent that increase in price alone does not affect consumption.[36] In fact, the Pulp and Primary Paper Industry, in recent years, has expanded enormously and its products are successfully competing with a great variety of products in other industries.[37] The fact that considerable price fluctuations in the industry have not prevented its expansion is indicative of the fact that the recommended minimum will have little, if any, effect upon employment in the industry.[38] Upon all the evidence, I find that the Pulp and Primary Paper Industry is capable of absorbing any increases in wage costs which will result directly or indirectly from the proposed minimum of 40 cents an hour.

In conclusion, having considered all factors relating to the effect of a 40 cent minimum wage rate upon aggregate employment in the Pulp and Primary Paper Industry, I find that, having due regard to economic and competitive conditions, this rate will not substantially curtail aggregate employment in the Pulp and Primary Paper Industry.

B. Dislocation of Employment in the Industry.

1. *Adequacy of Wage Data.*

In connection with the opposition of the American Paper and Pulp Association to the recommendation of the Committee, it was urged that the establishment of a 40 cent minimum would cause a dislocation of employment in the pulp and paper mills in the industry by compelling the liquidation of "small" mills located in "small" communities.[39] Furthermore, it was contended that the wage data presented to the Committee relating to such "small" mills[40] were inadequate.[41] Accordingly, it will, in the first instance, be necessary to consider the adequacy of the wage data before the Committee[42] and, thereafter, the effect of the proposed minimum according to region and upon low wage plants wherever located.

A wage survey of pulp and paper plants, exclusive of paper board mills, was made by the American Paper and Pulp Association in October, 1938, for the purpose of obtaining wage data to be used in connection with the investigation of the industry pursuant to the Act.[43] Questionnaires were mailed to all pulp and paper mills. Of these mills, 457 replied and 141 failed to reply.[44] These original returns were

[30] According to a special unweighted tabulation by the United States Bureau of Labor Statistics of data from the American Paper and Pulp Association survey of October 1938, 81.8 percent of the employees in converting departments of all mills received 40 cents an hour or over as compared to 93.1 percent in all other departments. See Administrator's Exhibit 17, Table 2. 6.8 percent of the employees in converting departments received exactly 39 cents, 2.7 per cent received 38 cents and 2.0 percent received 37 cents, thus establishing that the majority of converting department employees, receiving under 40 cents an hour received 37 cents or more. Administrator's Exhibit 6; R. p. 130.

A 40 cents minimum, if it affected converting department employees would increase the wage bill for converting departments 1.15 percent as compared to 0.45 percent for pulp and primary paper mills, excluding converting departments. The effect of such a minimum would be to increase the wage bill of all departments in integrated mills 0.51 percent. Administrator's Exhibit 17, Table 3. The average wage in the industry (excluding converting departments) would, as the result of the establishment of a 40 cent minimum, be increased from 62.3 cents to 62.6 cents whereas the average wage in integrated mills (including converting departments) would be increased from 60.8 cents to 61.1 cents. Administrator's Exhibit 17, Table 5.

[31] The average value per ton of the industry's products amounts to $69.15. The establishment of a 40 cent minimum would increase the cost per ton an average of only 9.3 cents. Administrator's Exhibit 22.

[32] Administrator's Exhibit 9, p. 78; R. p. 132. The ratio of operation as related to capacity may affect the ability of the industry to absorb the cost of wage increases. The competitive relationship between paper and other products may affect the chance of passing on the increased cost of wage increases without curtailing consumer demand and thus without curtailing employment. The factor of foreign trade has a bearing on both the availability of raw materials and on the competition of the finished products with those of other countries which would not be affected by a minimum wage in the United States. The trends of wholesale prices throw some light on the degree to which changes in costs are likely to be reflected in such price changes as might affect the volume of demand and hence affect employment in the industry.

[33] The rate of production has never been above 85 percent of the potential capacity although certain branches have approached 100 percent. Administrator's Exhibit 9, p. 79.

[34] When the industry falls below 70 percent of potential production, unit costs rise so high that little or no profit can be realized. *Idem.* In 1937, 82.4 percent of the industry's capacity was utilized while only 70.3 percent was utilized in 1938. See Administrator's Exhibit 9, Table 30, p. 80.

[35] Average wholesale prices for the three types of wood pulp dropped appreciably between 1929 and 1932. Prices of mechanical pulp, on the other hand, were higher in 1930 and 1931 than in 1929. The price of sulphate and sulphite pulp declined beginning with 1930. Sulphite pulp in 1937 reached a price index of 112.2 compared to 68.7 in 1936, but in 1939, it fell again to 66.7. Mechanical pulp reached its peak of 93.6 in 1931 and its lowest point of 69.7 in 1935. The price of Kraft pulp hovered between 55 and 65 for the five years from 1932 to 1936. Administrator's Exhibit 9, pp. 90-91. The price history of finished paper products did not exhibit such extremes, leading to the conclusion that changes in the cost of pulp are not immediately reflected in changes in the prices of paper or board. *Ibid,* p. 92.

[36] See Administrator's Exhibit 9, Table 40, p. 84 and Table 43, p. 91. The apparent consumption of sulphite pulp reached an all time high of 3,261,000 tons in 1937. The consumption of Kraft pulp reached 2,871,000 tons in 1937, the highest recorded, with the exception of 1938 when 2,947,000 tons were consumed. Mechanical pulp consumption was 1,819,000 tons, second only to 1929 when it reached 1,911,000 tons. Kraft and sulphite pulp in 1937 reached an average wholesale price index of 98.1 and 112.2 respectively, the highest in eleven years. The price index of mechanical pulp was 89.2 in 1937, which was lower only than the index of 93.4 for 1930 and 93.6 for 1931.

[37] Paper and paperboard compete with textiles, wood, glass, metals and clay products. Particularly, there has been an expansion of their use in the building industry, in the manufacture of shipping containers, tissue paper, napkins, towels, and in the manufacture of paper board containers, paper plates and cups, and in wrapping paper and paper used for the production of paper sacks. Administrator's Exhibit 9, pp. 81-82.

[38] That there is much room for expansion of wood pulp manufacture in this country is disclosed by the evidence on the importation of wood pulp. In 1937, 43.9 percent of the sulphite used, 12 percent of the groundwood, 2 percent of the soda, and 25.6 percent of the sulphate was imported. Administrator's Exhibit 9, Table 40, p. 84. Imports in 1938 represented 20.5 percent of the domestic production of paper and paperboard. Exports represented only 2.1 percent. The importation of newsprint represented 273.3 percent of the domestic production. The exports were only 0.7 percent. *Ibid,* Table 42, p. 88.

[39] See testimony of E. W. Tinker, R. p. 231 *et seq.* Mr. Tinker testified that he considered "insignificant" the number of employees who would be affected by a 40 cent minimum and the increase in the industry's wage bill. He urged, however, that "real consideration should be given to the possible liquidation of small enterprises supporting small communities."

[40] It appears from the record that all parties are in agreement that "small mills in small communities" are mills having a daily capacity of less than 100 tons and located in centers with population of less than 5000 within their corporate limits. See Administrator's Exhibit 16, R. pp. 119, 121; Administrator's Exhibit 1-E (Committee Exhibit 18).

[41] Testimony of E. W. Tinker, pp. 232-233.

[42] No contention was raised concerning the adequacy of the wage data or the effect of the proposed minimum as to paperboard mills. See footnote 14, *supra.*

[43] See testimony of Benton R. Cancell, R. p. 14 *et seq.*

[44] Only 434 complete replies were turned over to the Bureau of Labor Statistics, 23 having been found to be too incomplete for tabulation. R. p. 15.

turned over to the Bureau of Labor Statistics for study, checking and tabulation. After carefully checking the Association returns against a list comprising all the establishments in the industry, classified according to size, product, geographical location and other significant factors, the Bureau weighted the material, building the data to equal the total of employment in the industry, in order to obtain representative data with respect to small mills.[45] The weighted data were made available to the Committee and received in evidence at the hearing before the Presiding Officer.[46]

The Association also contended that the 141 mills which failed to answer the questionnaire were small mills located in small communities. The Wage and Hour Division analyzed 135 of these establishments and found that only 21 could be classified as small mills located in small communities.[47] Four of these mills were included in the Bureau of Labor Statistics study. The Bureau also analyzed the sample obtained by the American Pulp and Paper Association and found that 67 plants are located in population centers of less than 5000 and 53 of these plants could properly be classified as small.[48] Thus, 53, or approximately ¼ of the 74 small mills located in small communities were covered by the wage data presented to the Committee and adduced at the hearing before the Presiding Officer.

I find that the wage data presented before the Industry Committee and received in evidence at the hearing are an adequate reflection of the wage structure prevailing in the Pulp and Primary Paper Industry.

2. *Regional Distribution of the Industry.*

The Pulp and Primary Paper Industry is distributed over 38 states.[49] The evidence indicates that there is a wide variation in average hourly earnings by individual plants thus tending to establish that regional factors have no significance in influencing the industry's wage structure. The study of paper and pulp plants, prepared by the Research and Statistics Branch of the Wage and Hour Division, discloses that average hourly earnings among such plants ranges from under 40 cents to over 85 cents.[50] The Bureau of Labor Statistics study of paperboard plants show that average hourly earnings range from under 35 cents to over 82.5 cents.[51] In pulp and paper establishments, average hourly earnings range from 55.6 cents for the Southern region to 77.5 cents for the Pacific Region.[52] In paperboard establishments, average hourly earnings range from 48.5 cents to 73.8 cents for the same regions.[53] Only three pulp and paper plants out of the 296 included in the sample had average hourly earnings of less than 40 cents. Two of these plants are located in the Northeastern region where the survey covered 164 plants and one in the Southern region where the survey covered 15 plants.[54] Seven paperboard plants out of a sample of 134 have average hourly earnings under 42.5 cents. Three of these are located in the Northeastern region where the survey covered 57 plants, three in the Southern region where the survey covered 14 plants, and one in the Lake region where the survey covered 12 plants.[55] It is estimated that 6.4 percent of the pulp and paper workers and 6.9 percent of the paperboard workers would be directly affected by a 40 cent minimum.[56] In the East Central and Southern regions, however, the percentages of pulp and paper workers which would be affected directly were found to be 11.1 percent and 22.0 percent respectively,[57] and the percentages of paperboard workers were 34.2 percent and 23.7 percent respectively.[58] Despite these comparatively high percentages, the number of workers in these two regions which would be affected by the establishment of a 40 cent minimum would be small.[59] The estimated direct increase in the wage bill of pulp and paper

[45] See testimony of H. E. Riley, an economist with the Bureau of Labor Statistics, R. pp. 23, 25-28.

[46] Administrator's Exhibits 2, 4, 6, 7A, 7B, 9, and 17.

[47] Administrator's Exhibit 16; R. p. 119, *et seq.* Of the 135 mills, 40 were convertors and not included within the definition of the industry. Another 29 were manufacturers of paperboard or paperboard in conjunction with pulp and paper. These plants were covered in a survey comprising 134 representative establishments and 16,332 or approximately 50 percent of the wage earners. Administrator's Exhibit 3. Seven of the 135 mills reported a daily capacity of over 100 tons and were, therefore, not small mills. Twenty-two were located in communities having a population of more than 5000 and were, accordingly, not located in small communities. Ten comprised a miscellaneous group, 4 of which were no longer manufacturing, 1 of which was engaged in retailing and not in manufacturing, 1 was in bankruptcy, and 4 are divisions of large corporations and, therefore, not in the small mill category. Six mills were not reported in Lockwood's Directory, the industry's official guide book. R. p. 119 *et seq.* Of the 21 small mills, 11 are in New York, 2 in Wisconsin, 4 in New Hampshire, 2 in Massachusetts, 1 in Vermont and 1 in Pennsylvania. It should be noted that none of these plants are located in the East Central or Southern regions where the lowest average hourly rates prevail for both pulp and paper and paperboard workers. See Administrator's Exhibits 16, 3, and 9 (Tables 28 and 29, pp. 57 and 58).

[48] The average hourly wage in each of the 4 plants is 46.3 cents, 57.1 cents, 61.3 cents, and 68.7 cents. R. p. 121.

[49] These states are divided into six regions, namely, the Northeastern, Eastern, Central, Southern, Midwestern, Lake, and Pacific. Administrator's Exhibit 9, p. 16 *et seq.* No contention was made that dislocation of employment would occur in any region within the Pulp and Primary Paper Industry.

[50] Three of the 296 plants surveyed averaged under 40 cents. Two of these plants are in the Northeastern region and one is in the Southern region. Three plants averaged over 85 cents, two being in the Pacific region and one in the Northeastern. Administrator's Exhibit 2.

[51] Only one of the 134 plants surveyed averaged under 35 cents and that was located in the Southern region. One plant, located in the Pacific region, averaged over 82.5 cents. Of the seven plants averaging 42.5 cents or less, three were in the Northeastern region, one in the Southern, and one in the Lake. Administrator's Exhibit 3, Table 2, p. 7.

[52] Administrator's Exhibit 9, Table 28, p. 57. The average hourly earnings of pulp and paper employees in the United States as a whole is 63.1 cents; in the Northeastern region, 60.6 cents; in the East Central region, 59.3 cents; in the Southern region, 55.6 cents; in the Midwestern region, 59.7 cents; in the Lake region, 64.2 cents; and in the Pacific region, 77.5 cents.

[53] *Ibid.*, Table 29, p. 58. The average hourly earnings of paperboard workers in all regions is 59.8 cents; in the Northeastern region, 60.6 cents; in the East Central region, 48.5 cents; in the Southern region, 52.8 cents; in the Midwestern region, 61.1 cents; in the Lake region, 64.2 cents; and in the Pacific region, 73.8 cents.

[54] Administrator's Exhibit 2, Table 1.

[55] Administrator's Exhibit 3, Table 2, p. 7.

[56] The pulp and paper survey was made as of October 1938, and the paperboard survey was made as of November and December 1939.

[57] Administrator's Exhibit 9, Table 25, p. 53. In the Northeastern region, the percentage of workers directly affected is exactly that of the country as a whole, 6.4 percent. In the Midwestern and Lake regions, the percentages are only 2.9 percent and 2.8 percent respectively, and in the Pacific region, the percentage is less than 5/1000 percent.

[58] *Ibid.*, Table 26, p. 55. The percentage of those paperboard workers affected in other regions are 1.1 percent in the Northeastern, 0.6 percent in the Midwestern, 1.0 percent in the Lake, and none in the Pacific.

[59] *Ibid.*, Table 25, p. 53. Of the 96,427 wage earners estimated to be employed in pulp and paper plants, 526 in the East Central region and 2,105 workers in the Southern region would receive wage increases. Of the 32,664 wage earners estimated to be employed in paperboard plants, 665 workers in the East Central region and 1,415 in the Southern region would receive pay increases. *Ibid.*, Table 26, p. 55.

[60] *Ibid.*, Table 27, p. 56. Among all pulp and paper plants, the direct increase in the wage bill resulting from a 40 cent minimum is estimated to be 0.44 percent. In the Northeastern region, the increase would be 0.35 percent; the Lake region, 0.12 percent; the Midwestern region, 0.11 percent; and the Pacific region, less than 5/1000 of 1 percent. It is to be noted in this connection that 30.6 percent of the workers and 42.6 percent of the plants are located in the Northeastern region, 14.8 percent of the workers and 9.0 percent of the plants are located in the Lake region and 24.5 percent of the employees and 24.6 percent of the plants are located in the Midwestern region.

The wage bill of all paperboard plants would be increased 0.47 percent. The increase for the plants in the Northeastern region would be 0.05 percent, for the Lake region, 0.07 percent, for the Midwestern region, 0.04 percent, and for the Pacific region, 5/1000 of 1 percent. It is to be noted that 47.8 percent of the workers and 55.4 percent of the plants are located in the Northeastern region and 20.4 percent of the workers and 21.3 percent of the plants are located in the Lake region.

plants which would result from establishment of the recommended minimum would be 0.98 percent for the East Central region and 2.35 percent for the Southern region, and, for paperboard plants, 1.86 percent for the East Central region and 2.12 percent for the Southern region.[60]

Upon all the evidence, I find that no substantial dislocation of employment as between geographical regions will result from the establishment of a 40 cent minimum wage rate.

3. *Effect of the Minimum Wage Rate on Low Wage Plants*

Pulp and paper plants, paying an average hourly wage of less than 50 cents, would, by the establishment of a 40 cent minimum, be subjected to direct wage bill increases ranging from 2.49 percent to 15.9 percent. These plants account for 14.5 percent of the total number of pulp and paper plants.[61] and 7.1 percent of the employment.[62] Those paperboard plants paying an average hourly wage under 45 cents, comprise 9.7 percent of the plants[63] and 10.5 percent of the workers. The recommended minimum would in such plants cause a direct wage bill increase of 4.19 percent.[64] Since labor costs in the industry represent less than one-fourth of operating costs,[65] it is apparent that even among the small percentage of plants which can be classified as low wage plants, the increase in operating costs resulting from the establishment of a 40 cent minimum will not be substantial.

Upon the basis of the study of the industry made by the Bureau of Labor Statistics, low-wage plants were considered not only in connection with their regional location, more particularly discussed hereinabove, but also as to type of products manufactured,[66] sizes of plants, and sizes of communities in which the plants are located. The evidence establishes that there is a wide dispersion of low-wage plants with respect to size,[67] location[68] and type of product manufactured.[69] Furthermore, high-wage plants are of all sizes,[70] are found in all regions[71] and manufacture products similar to those manufactured in low-wage plants.[72] In addition, the evidence establishes that low wage mills are not all located in small communities.[73] Both high and low-wage plants are distributed among both small and large communities.[74] Accordingly, it is apparent that even the small low-wage plants located in small communities will not be disproportionately affected by the establishment of the proposed minimum.

Upon the entire record, including those matters discussed in connection with the consideration of the effect of the recommended minimum on aggregate employment, I find that there will be no substantial dislocation of employment among low-wage firms in any region or definable group or in small mills in small communities in the Pulp and Primary Paper Industry.

* * *

Viewing, therefore, all the evidence adduced at the hearing relating to the effect which the proposed minimum will have upon the Pulp and Primary Paper Industry and upon the low-wage firms, the small mills located in small communities, and the areas in the industry, especially the evidence offered by those who opposed the Committee's recommendation at the hearing, I find that no substantial dislocation of employment in the industry will result from the establishment of a 40 cent minimum wage rate and that, having due regard to economic and competitive conditions, the proposed minimum will not substantially curtail employment in the Pulp and Primary Paper Industry or in any definable group of plants or regions within the industry.

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[61] See Administrator's Exhibit 9, Table 19, p. 42. This entire group includes 43 of the 296 plants sampled.

[62] *Idem.* See also *ibid*, Table 21, p. 46.

[63] This group includes 13 of the 134 plants sampled. *Idem.*

[64] *Idem.*

[65] Administrator's Exhibit 9, Table 36, p. 71. It is estimated that the minimum ratio of labor costs to operating costs is 17.1 percent and the maximum is 22.2 percent.

[66] The plants in which the more important products are manufactured and which would show direct increases in wage bills above the general average make paperboard, wrapping paper and writing paper. The paperboard increase would amount to 0.47 percent as compared to 0.45 percent for the entire industry. Wage bills in wrapping paper and writing paper plants would be increased 0.70 percent and 0.53 percent respectively. Plants manufacturing absorbent paper and miscellaneous paper, respectively constituting but 4.7 percent and 3.1 percent of the plants in the industry would have wage bill increases of slightly above 1 percent. See Administrator's Exhibit 9, Table 23, p. 50.

[67] Of the 296 pulp and paper plants included in the Bureau of Labor Statistics survey, 13 reported average hourly earnings under 45 cents. Of these 13 plants, classified as low wage plants, 4 employed less than 50 workers, 2 employed from 51 to 100 workers, 3 employed from 101 to 250 workers, and 4 employed from 251 to 500 workers. Administrator's exhibit 9, p. 66. Of the 4 low-wage plants in communities having populations of less than 5000, 2 have a daily capacity of under 50 tons, 1 of 51 to 100 tons, and 1 of over 100 tons. Administrator's Exhibit 7A.

[68] For example, there are 43 pulp and paper plants paying average hourly earnings of less than 50 cents. Thirty of these are located in the Northeastern region, 6 in the Lake region, 3 in the East Central region, 3 in the Southern region, and one in the Midwestern region. Only 6 of these, or less than 1/7, are located in the Southern and East Central regions, estimated to be the regions which would be most affected by a 40 cent minimum. See Administrator's Exhibit 2, Table 1.

Similarly, 31 paperboard plants paying average hourly earnings of less than 50 cents are distributed through 5 regions; namely, 13 in the Northeastern region, 6 in the East Central region, 7 in the Southern region, 4 in the Midwestern region, and 1 in the Lake region. See Administrator's Exhibit 3, Table 2, p. 7.

Of the 43 pulp and paper plants, 4 are located in communities under 2500 in population, 16 in communities over 2500 and under 5000, 7 in communities over 5000 and under 10,000, 6 in communities over 10,000 and under 25,000, 2 in communities over 25,000 and under 50,000, and 8 in communities over 50,000. Administrator's Exhibit 4.

[69] Of the 43 low-wage pulp and paper plants, 14 produce writing paper of many types, 12 produce tissue paper of various sorts, 9 produce many kinds of wrapping paper, 5 produce only pulp, and 3 produce different forms of absorbent paper. These 43 plants produce at least 5 of the 8 major categories of pulp and paper products. See Administrator's Exhibit 9, pp. 76-77.

The 31 paperboard plants produce various types of paperboard, such as wall-board, wet-board, box-board, and the like. *Idem.*

[70] High-wage pulp and paper plants for the most part are comparatively large in size, while low-wage plants tend to be somewhat smaller. Administrator's Exhibit 9, p. 66. Yet among the plants having average hourly earnings in excess of 50 cents, 29 employ less than 50 workers, 42 employ 51 to 100, 72 employ 101 to 250, 70 employ 251 to 500, and 40 employ over 501. Administrator's Exhibit 9, Table 35, p. 67.

[71] See Administrator's Exhibit 2, Table 1.

[72] See Administrator's Exhibit 2, Tables 3 and 4.

[73] Of 67 pulp and paper mills located in communities having populations under 5000, only one had average hourly earnings under 40 cents. Administrator's Exhibit 4. Of 30 paperboard mills located in communities having populations under 10,000, only 2 had average hourly earnings under 45 cents. Administrator's Exhibit 5.

[74] Of the 13 pulp and paper plants having average hourly earnings under 45 cents, 1 is located in a community having a population under 2500, 5 over 2500 and under 5000, 3 over 5000 and under 10,000, 2 over 10,000 and under 25,000, 1 over 25,000 and under 50,000, and 1 over 50,000 and under 100,000. Administrator's Exhibit 4.

Of the 6 paperboard plants having average hourly earnings under 45 cents, 2 are located in communities under 10,000, 1 in over 25,000 and under 100,000, 3 over 100,000 and under 500,000. Administrator's Exhibit 5.

The high-wage plants for the entire industry show even a wider distribution according to size of city. *Idem.*

[75] See Section III B, *supra.*

[76] See Testimony of Miss Faith N. Williams, Chief of the Cost of Living Division of the Bureau of Labor Statistics, R. p. 185, *et seq.* Miss Williams testified with respect to a study entitled "Differences in Living Costs in Northern and Southern Cities" (Administrator's Exhibit 26) and a table entitled "Living Costs at the 'Maintenance' Level for a Family of 4, in 41 Cities in the United States, December 15, 1938" (Administrator's Exhibit 27). Her testimony was based upon original studies of living costs in 5 small Northern and 5 small Southern representative industrial cities and upon budgets made by the W. P. A. in 1935 and adjusted as of December 15, 1938, covering 20 Northeastern and 15 Southeastern cities. The evidence establishes that cost of living varies between cities of the same size and does not vary in accordance with size. Although communities under 10,000 were not covered by the studies, it may be inferred that these variations exist within this size group as well. R. p. 198. See also treatment of similar evidence on living costs in *Findings and Opinion of the Administrator in the Matter of the Recommendation of Industry Committee No. 6 for a Minimum Wage Rate in the Shoe Manufacturing and Allied Industries.*

IV. Necessity for Classification Within the Pulp and Primary Paper Industry

No contention was made at the hearing that a classification should be established for plants in any definable group or region in the Pulp and Primary Paper Industry. As I have found hereinabove, there is no justification for the establishment of minimum wage differentials for any definable group in the industry or for geographical reasons.[75] The record does not disclose differences in living,[76] transportation[77] or production costs[78] within this Industry or any differences in the minima provided in union contracts[79] in any of the manufacturing areas which would require or justify any classification within this Industry under Section 8(c) of the Act.[80] Moreover, since the recommendation of 40 cents which the Committee has made is the maximum permissible under the Act, and since I have heretofore found that no substantial curtailment of employment will result in the Industry as a whole or in any area or definable group of plants within the Industry, I conclude that no issue of a classification within the Pulp and Primary Paper Industry is presented by the evidence adduced.

Upon these facts, therefore, I find that:

(a) The 40 cent minimum wage rate for the Pulp and Primary Paper Industry is the highest minimum wage rate for the Industry which, having due regard to economic and competitive conditions, will not substantially curtail employment in the Industry; and

(b) It is not necessary to make separate minimum wage rates for any classification within the Pulp and Primary Paper Industry for the purpose of fixing for each such classification the highest minimum wage rate (not in excess of 40 cents an hour) which (1) will not substantially curtail employment in such classification and (2) will not give a competitive advantage to any group in the Industry; and

(c) In determining that no such classification within the Pulp and Primary Paper Industry should be made, consideration has been given to, among other relevant factors, the following: (1) competitive conditions as affected by transportation, living and production costs; (2) the wages established for work of like or comparable character by collective labor agreements negotiated between employers and employees by representatives of their own choosing; and (3) the wages paid for work of like or comparable character by employers who voluntarily maintain minimum wage standards in the Industry.

(d) Considering living, production, and transportation costs, together with the evidence on collective labor agreements and voluntary wage standards, I find that these costs do not differ between any reasonably definable groups or regions within the Pulp and Primary Paper Industry so as to affect competitive conditions within the Industry or make necessary a classification within the meaning of Section 8(a) of the Act.

(e) Under all the circumstances and upon all the evidence, I conclude that the creation of a separate classification for any region or definable group in the Industry is unjustified.

V. Conclusion

Upon reviewing all the evidence adduced in this proceeding and giving consideration to provisions of the Act and the same factors required to be considered by the Industry Committee, I conclude that the Industry Committee's recommendation for the Pulp and Primary Paper Industry, as defined in Administrative Order No. 41, is made in accordance with law, is supported by the evidence adduced at the hearing, and will carry out the purposes of Section 8 of the Act.

VI. Posting of the Wage Order

Section 8(f) of the Act provides that wage orders issued under Section 8 "shall define the industries and classifications therein to which they are to apply, and shall contain such terms and conditions as the Administrator finds necessary to carry out the purposes of such orders, to prevent the circumvention and evasion thereof, and to safeguard minimum wage rates established therein."

In order to carry out the purpose of the wage order issued herein and to prevent its circumvention and evasion, I find it necessary that every employer employing any employees engaged in commerce or in the production of goods for commerce in the Pulp and Primary Paper Industry shall post and keep posted in each department of his establishment where such employees are working such notices of this wage order as shall be prescribed from time to time by the Wage and Hour Division.

The wage order issued pursuant to this opinion shall become effective on September 16, 1940.

[77] See Testimony of Frank A. Delgado, economist in the Research and Statistics Branch of the Wage and Hour Division. R. p. 163 *et seq.* Mr. Delgado has made a study of the effect of transportation costs on the competitive situation in the Pulp and Primary Paper Industry. Due to the complexity of the industry and the wide distribution of the product to different areas of consumption, Kraft sulphate wrapping paper, unbleached, was selected as representative of the industry. Its relatively low price would render the freight rate on such a product higher in percentage than for other products. A number of shipping points were selected in each major region, due regard being given to the major areas of production and consumption, with respect to the all rail freight rates per 100 pounds for shipments of Kraft wrapper paper less than carload lots between 13 selected points of origin and 18 widely separated points of destination; freight charges per 100 pounds range from 30 cents between Lawrence and Boston, Mass., to $3.22 from Longview, Washington, and Boston. Transportation by water affords much lower rates whenever it is available.

Mr. Delgado selected, as a basis of comparison, Lockland, Ohio, and Hudson Falls, New York, because a disadvantage would be less on short hauls, and, as to long hauls, such as from coast to coast, he did not believe that paper producers would ship to such distant points. R. p. 173. The net disadvantage of Hudson Falls as compared to Lockland is only 8 percent of the value of a pound of Kraft wrapping paper having an average value of 4½ cents per pound. See Administrator's Exhibits 24 and 25.

The chief raw material used in the manufacture of paper is wood pulp which is itself "goods in process." Due to the high transportation costs of pulp wood, which is from 10 to 30 percent of the total cost, pulp and paper mills are located within the immediate producing areas. See Administrator's Exhibit 23, pp. 12, 13, and 258. There is no transportation problem in the South since practically all the Southern production of pulp is located at or near the source.

Mr. Delgado is of the opinion that some mills have advantages in shipments to certain markets and disadvantages to others and that in some instances a disadvantage with respect to shipments of finished products is offset by an advantage as regards the cost of transporting raw materials. Complete equalization of transportation cost disadvantages by means of established wage differentials, he testified, would require an accurate determination of minimum wage rates for each shipment by each mill depending upon the particular destination. R. p. 183.

[78] No contention was made that a classification is necessary in the industry because of higher production costs in any definable group or region. Although the evidence reveals that pulp is produced in every region of the United States and that the cost of producing pulp differs in different regions (Administrator's Exhibit 23, p. 16), there is little, if any, competitive disadvantage due to the fact that the vast majority of the pulp is produced for local consumption. R. p. 176; Administrator's Exhibit 23, p. 11.

[79] The International Brotherhood of Pulp, Sulphate and Paper Mill Workers and the International Brotherhood of Paper Makers, both affiliated with the American Federation of Labor, in 1939, had a combined membership of 52,000, including converted paper products workers. It is estimated that approximately 30 percent of the 137,803 employees in the Pulp and Primary Paper Industry operate under union agreements. Administrator's Exh. 9, p. 101. The minima established by union agreements range from 38 cents to 62½ cents an hour. The rates range from 38 cents to $1.42 an hour. There are very few such agreements in Southern Mills.

[80] Similarly it does not appear from the record that any substantial groups of employers within the Industry are maintaining recognized minimum wage standards justifying the creation of a classification in accordance with Section 8 of the Act.

TAPPI Fall Meeting Program

Seattle, Wash., August 20, 21, 22, 23, 1940

Tuesday, August 20

Auditorium of Bagley Hall, University of Washington

9:30 A. M. Address of Welcome by Dr. Lee Paul Sieg, President of the University of Washington.

Color moving picture, "Magic Fibers," of pulpwood forests, logging operations and the manufacture of wood pulp in the State of Washington.

Pacific Northwest Forest Resources Symposium:—

Professor B. L. Grondal, College of Forestry, University of Washington, presiding.

The symposium will present the practical viewpoint of private forest management toward the production of timber primarily for wood pulp and secondarily for lumber. Due consideration will be given to the area of Pacific Northwest forest land necessary to furnish a perpetual supply of pulpwood for an average size pulp mill.

The major forestry problems involved will be discussed by:

E. P. Stamm, Logging Superintendent, Crown Willamette Paper Company, Division of Crown Zellerbach Corporation.

W. H. Price, forester, Weyerhaeuser Timber Company.

Warren Tilton, forester, West Coast Lumbermen's Association.

12:00 NOON Luncheon at the University of Washington Commons.

2:00 P. M. Auditorium of Bagley Hall, University of Washington.

W. R. Barber, Technical Director, Crown Zellerbach Corporation, presiding.

The following papers will be presented:

"Studies on Absorption of Sulphur Dioxide," by Warren L. Beuschlein, University of Washington.

"Nitric Acid Pulping," by A. T. Walton, University of Washington.

"Pulping of Douglas Fir by Sodium Sulphite," by K. A. Kobe of the University of Washington and L. C. Haffner of Portland, Ore.

"Chemistry of Bark and Its Relations to Paper Making Problems," by H. L. Lewis, Institute of Paper Chemistry, Appleton, Wis.

"Applications and Limitations of the Rod Mill," by Sidney D. Wells, Institute of Paper Chemistry, Appleton, Wis.

"Use of Soda Ash—Sulphur in Sulfate Recovery Units From the Operating Viewpoint," by W. L. Gillespie, Gaylord Container Corporation, Bogalusa, La.

Wednesday, August 21

Bagley Hall, University of Washington

9:00 A. M. The Wednesday morning technical program will be in two sections, A and B, presented simultaneously:

SECTION A:

Lignin Symposium:—

George H. McGregor, Superintendent Longview Mill, Pulp Division, Weyerhaeuser Timber Company, will preside.

The following papers will be presented for discussion:

"Structure and Formation of Lignin", by J. L. McCarthy, McGill University, Montreal, Canada.

"Recent Advances in the Chemistry of Lignin", by F. E. Brauns, Institute of Paper Chemistry, Appleton, Wis.

"Chemistry of Butanol Lignin", by A. J. Bailey, University of Washington, Seattle, Wash.

"Effects of Ultra Violet Light on Lignin", by L. V. Forman, Institute of Paper Chemistry, Appleton, Wis.

"Ultra Violet Adsorption Spectra of Lignin", by R. E. Gladding, Institute of Paper Chemistry, Appleton, Wis.

One or two additional papers by eminent lignin research men are expected to be added to this symposium.

SECTION B:

Clark C. Heritage, Technical Director, Wood Conversion Company, Cloquet, Minn., presiding.

The following papers will be presented before Section B:

"Air Filtration in Pulp and Paper Mills," by R. E. Chase, Tacoma, Wash.

"Symposium on Head Boxes and Slices," with W. G. McNaughton as leader. Two or three speakers will present their views for discussion.

"Bark Burning Furnaces," by C. A. Hulsart, Babcock & Wilcox Company, New York.

12:00 NOON Luncheon at the University of Washington Commons

2:00 P. M. Bagley Hall, University of Washington.

N. W. Coster, Technical Director, Soundview Pulp Company and Chairman, Pacific Section of Tappi, presiding.

The Wednesday afternoon presentation of technical papers will probably be divided into two sections. Definite announcement will be made later. The following papers will be presented:

"Cross Sections of Pulp Fibres," by John H. Graff, Institute of Paper Chemistry, Appleton, Wis.

"Influence of Dyestuffs on Paper Opacity," by E. R. Laughlin of E. I.

Du Pont de Nemours & Company, Wilmington, Del.

"Notes on Application of Starch in Paper Making," by B. W. Rowland, Institute of Paper Chemistry, Appleton, Wis.

"Effect of Subliners on Board Brightness," by William R. Willets, Titanium Pigment Company, Inc., Brooklyn, N. Y.

"Chipper Knives and Knife Grinding," by Niles Johnston, Simonds Worden White Company, Dayton, Ohio.

"An Experience in Vocational Instruction," by O. T. Defieux, Steam Plant Superintendent, Crown Willamette Paper Company, Division of Crown Zellerbach Corporation, Camas, Wash.

"Comparison of Various Speck Count Methods," by John H. Graff and A. P. Adrian, Institute of Paper Chemistry, Appleton, Wis.

"Adhesive Properties of Methocel," by F. C. Peterson, Dow Chemical Company, Midland, Mich.

6:30 P. M. Five Group Dinners will be held in private dining rooms of the Olympic Hotel. Each dinner will be devoted to the discussion of selected subjects under a group leader.

Following are the subjects to be discussed at the Group Dinners:

Acid Pulping and Bleaching—with W. Norman Kelly, Manager Longview Mill, Pulp Division, Weyerhaeuser Timber Company, as group leader.

Alkaline Pulping and Bleaching—with Dr. Carl E. Curran, chief, Section of Pulp and Paper, U. S. Forest Products Laboratory, Madison, Wisconsin, as group leader.

Power—with Henry W. Beecher, Power Plant Engineer, Seattle, as group leader.

Applied Hydraulics—with R. V. Bingham, President of the Bingham Pump Company, Portland, as group leader.

Paper Machine Problems—with R. S. Wertheimer, Resident Manager and Secretary-Treasurer, Longview Fibre Company, as group leader.

Each group leader will be assisted by three or four men experienced in the subject under discussion.

TAPPI to Visit Soundview Woodlands

"We're all set to take the entire 1940 Meeting of TAPPI into the woods to see the logging of the big timber," says Leo S. Burdon, Chairman of the Woods Trip Committee. "Every detail has been carefully planned by the Soundview Pulp Company's logging superintendents to make this trip on Thursday, August 22nd, a real highlight of the meeting in Seattle.

"To see for one's self how the big mature timber of the Pacific Northwest is harvested and provision made for the natural reseeding for another crop, is not only educational but of absorbing interest, particularly at this time when we are more dependent upon our own forest resources than ever before."

CONSTRUCTION NEWS

Pensacola, Fla.—The Florida Pulp and Paper Company, Inc., Pensacola, organized a number of months ago with capital of $3,000,000, has awarded general contract to the Rust Engineering Company, Clark Building, Pittsburgh, Pa., for proposed new pulp and paper mill on tract of land near Pensacola, known as Cantonment, previously noted in these columns. Work on erection is scheduled to be placed under way at once. Plant will consist of several large one and multi-story units for pulp division and finished paper-making division, with power house, pumping station, machine shop and auxiliary buildings. It will be equipped for the production of white wrapping papers, writing and book papers, using Southern pine as raw material. It is estimated to cost close to $3,000,000, with machinery, and will be ready for production early in the fall of 1941. Company also has secured a large tract of timberlands in Escambia County, held by James G., J. C., and A. D. Pace, Pensacola, and will develop for pulpwood supply, with installation of sawmills, shops and other structures. Hardy S. Ferguson & Company, 200 Fifth avenue, New York, N. Y., are consulting engineers for new mill. James H. Allen is president of new company, and A. D. Pace, noted, will be an official of company.

Kalamazoo, Mich.—The Bryant Paper Company, manufacturer of book, catalog and other paper stocks, has advanced production at its mill with the placing of a seventh paper-making machine in operation, increasing output by about 30 tons per day. This placed the plant at close to a capacity schedule. Working force, also, recently has been increased. It is expected to hold to the enlarged production schedule for an indefinite period.

Rockingham, N. C.—The Sonoco Products Company, Rockingham Division, manufacturer of news board stocks, paper for cones, tubing, etc., has taken over mill of Southern Tissue Mills, Inc., in Midway district, recently acquired, and will use for immediate expansion. Arrangements are being completed for the removal of two divisions from company mill at Hartsville, S. C., to Rockingham, where increased facilities will be provided.

Beaumont, Tex.—William G. Powell, director, Beaumont Industrial Bureau, is interested in a project to construct and operate a pulp and paper mill on site near Beaumont, fronting on the Neches River, and negotiations are under way with Governor W. Lee O'Daniel, Austin, Tex., to perfect plans and financing for plant, which will be carried out by private interests. Proposed mill will consist of several production units, equipped for the manufacture of kraft paper stocks, using Southern yellow pine for pulp wood. Project will include a power house, pumping station, machine shop and auxiliary mechanical structures, and is reported to cost close to $2,500,000, with machinery.

Howland, Me.—The former pulp and paper mill of the Advance Bag and Paper Company at Howland, has been acquired by the Atlas Plywood Corporation, 20 Providence street, Boston, Mass., which will take over property at once. Purchasing company will convert the paper-making department at the plant for plywood packaging service. A company now being organized has arranged for a lease of the pulp-making division at the plant, and will continue production for sulphate kraft pulp. Improvements will be made at once and operations resumed early in August. It is expected to develop the pulp mill to maximum capacity.

Plattsburg, N. Y.—The Berst-Forster-Dixfield Company, manufacturer of tissue and other paper stocks, has plans under way for two new additions to mill, consisting of a four-story structure, about 47 x 96 feet, and two-story building, 45 x 61 feet, reported to cost over $70,000, with equipment. Increased capacity will be carried out. Bids for erection are scheduled to be asked soon.

Burlington, N. C.—The May Hosiery Company, Main street, will establish its own box-manufacturing plant, exclusively for company product use. Portion of a recently completed three-story addition will be used for the new department, with equipment installation to be placed under way at once. Plant will have an initial capacity of about 500,000 hosiery boxes per month, with machinery installation reported to cost close to $35,000. It is expected to have the unit ready for operation in August.

Atlanta, Ga. — Montag Brothers, Inc., 182 Marietta street, N.W., paper products, has deferred the erection of proposed new addition to plant for expansion in converting, storage and distribution department, and will readvertise for bids for erection at a later date, now scheduled for early in the fall. The proposed structure will be three-story and basement, estimated to cost in excess of $45,000, with equipment, as previously noted in these columns. Robert & Company, Bona Allen Building, are architects and engineers.

Charlotte, N. C.—The Old Dominion Box Company, 528 Turner avenue, manufacturer of corrugated boxes and containers, has begun erection of new addition to plant, recently referred to in these columns, consisting of a one-story structure, about 80 x 100 feet, to be used for storage, distribution and other operating service. Work will be pushed to early completion. New unit is reported to cost approximately $35,000, with equipment. R. C. Hicks, Piedmont Building, has the general erection contract. M. R. Marsh, Builders' Building, is architect.

Chicago, Ill.—The American Label Company, 3942 West Belmont avenue, manufacturer of paper labels, rolls labels and other paper specialties, has leased an entire floor in building at Harrison and Peoria streets, totaling about 12,000 square feet of floor space, and will occupy for converting plant, expanding present capacity.

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending July 24, 1940

	High	Low	Last
A. P. W.	1¾	1¾	1¾
Armstrong Cork Co.	29½	28¾	28¾
Celotex Corp.	6¾	6½	6½
Celotex Corp., pf.	53	53	53
Certain-Teed Products Corp.	4¼	4⅛	4⅛
Certain-Teed Products Corp., pf.	22⅛	20½	22
Champion Paper & Fibre Co.	....	....	....
Champion Paper & Fibre Co., pf.	101	100¼	101
Congoleum-Nairn Co.	18¼	17¾	18
Container Corp. of America	14	13	14
Continental-Diamond Fibre Co.	5¾	5¾	5¾
Crown-Zellerbach Co.	14½	13⅞	14¼
Crown-Zellerbach Co., pf.	91	88	88½
Flintkote Co.	13¼	12⅝	12¾
Robert Gair	2⅜	2½	2½
Robert Gair, pf.	12¼	11¾	11¾
International Paper & Power	12⅞	11⅞	11⅞
International Paper & Power, pf.	48¾	46¼	46¾
Johns-Manville Corp.	56½	55	56
Johns-Manville Corp., pf.	127	127	127
Kimberly Clark Corp.	32¾	31⅝	31⅝
MacAndrews & Forbes	27¾	27½	27½
MacAndrews & Forbes, pf.	....	....	....
Masonite Corp.	25¾	24¼	24¼
Mead Corp.	....	....	....
Mead Corp., pf.	68	68	68
Paraffine Companies, Inc.	32	31⅝	31⅝
Paraffine Companies, Inc., pf.	....	....	....
Rayonier, Inc.	16	15¼	15½
Rayonier, Inc., pf.	29	29	29
Ruberoid Co.	14¾	14¾	14¾
Scott Paper Co.	40	40	40
Scott Paper Co., pf.	112¾	112¾	112¾
Sutherland Paper Co.	25	25	25
Union Bag & Paper Corp.	11	10½	10½
United Paperboard Co.	3¼	3¼	3¼
U. S. Gypsum Co.	62	60	61
U. S. Gypsum Co., pf.	176¾	176½	176½

New York Curb Exchange

High, Low and Last for Week Ending July 24, 1940

	High	Low	Last
American Box Board Co.	4⅜	4⅜	4⅜
Brown Co., pf.	16½	16½	16½
Great Northern Paper	....	....	....
National Container Corp.	10¼	10	10
St. Regis Paper Co.	2⅜	2⅜	2⅜
St. Regis Paper Co., pf.	56	56	56
Taggart Corp.	3	2¾	2¾

Kimberly-Clark Nets $2,291,535

[FROM OUR REGULAR CORRESPONDENT]

NEENAH, Wis., July 22, 1940—Net profits on common stock of the Kimberly-Clark Corporation were $2,291,535 for the twelve months ending June 30, and $1,074,761 for the six months ending the same date, according to a report issued last week.

Profit for the first quarter of 1940 totalled $595,600, and for the second quarter totalled $479,160. The profit for the 12-month period is equal to $4.69 per share of common stock, against $3.17 in the comparable 1938-1939 period.

Net sales for the 12-month period totalled $28,648,678. For the six-month period, the sales were $14,882,960, of which $7,384,383 was for the first quarter, and $7,498,576 was for the second quarter.

Profit from operations for the twelve months ending June 30 was $3,397,932. Gross profit totalled $5,955,498, and general and selling expenses totalled $2,577,596.

Container Corp. Profits Up

The Container Corporation of America and subsidiaries for the six months to June 30 reports a net profit of $1,128,735, equal to $1.44 a share on 781,253 capital shares, compared with $32,249, or 4 cents a share, last year. June quarter net profit, $619,021 or 79 cents a share, compared with $509,714, or 65 cents a share in the first quarter this year, and $8,049, or 1 cent a share, in second quarter of 1939. Twelve months to June 30: Net profit, $2,545,386, or $3.26 a share, compared with $181,970, or 23 cents a share, for preceding twelve months. Walter P. Paepcke, president, said provision for Federal income taxes had been made in accordance with the 1940 Revenue Act at 20.9 per cent. Sales for the six months' period this year were $14,485,000, against $10,444,000 a year ago, a gain of 38.7 per cent. The $5,000,000 bank loan arranged in March to provide funds for the retirement of outstanding 6 per cent first-mortgage bonds and 5 per cent debentures has been reduced to $4,400,000.

Johns-Manville Earnings Rise

The Johns-Manville Corporation reports for the three months ended June 30 a consolidated net income of $1,103,295, after all charges. The net was equal, after preferred dividend requirements, to $1.15 a share on company's outstanding common stock and compared with a net of $1,078,626, or $1.12 a common share, in the June quarter of 1939.

Net sales of the corporation and its subsidiaries for the quarter, according to Lewis H. Brown, president, amounted to $15,207,692, against $13,513,882 in the second quarter of 1939, an increase of 12.4 per cent.

For the six months ended on June 30 net income amounted to $1,884,976, equivalent, after preferred dividend requirements, to $1.92 a common share, compared with a revised net of $1,203,744, or 1.11 a share, in the first half of 1939.

Offering of I. P. C. Bonds Deferred

The proposed offering of International Paper Company first mortgage bonds has been postponed by the company and its underwriters. It had been expected that the financing plan could be completed before August 1 in order to permit the call of the company's 6 per cent refunding mortgage bonds on the next redemption date, September 1, but it has been found impracticable to carry out the original time schedule.

Nekoosa-Edwards Nets $90,553

The Nekoosa-Edwards Paper Company for the March quarter reports a net income of $90,553, equal to $1.44 each on 62,706 shares, against $37,816, or 60 cents, in the March quarter last year; net sales, $1,674,889 against $1,547,189.

Mosinee Loses $23,247

The Mosinee Paper Mills Company including Bay West Paper Company reports for the year to May 31 a net loss of $23,247, against $212,229 loss in previous year.

PAPER TRADE JOURNAL

Title Reg. U. S. Pat. Off.

Henry J. Berger
EDITOR

Vol. 111 July 25, 1940 No. 4

COMING EVENTS IN PAPER INDUSTRY

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY, Fall Meeting, Olympic Hotel, Seattle, Wash., August 20-23.

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—Second Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

NATIONAL SAFETY COUNCIL, PAPER AND PULP SECTION, Annual Meeting, Stevens Hotel, Chicago, Ill. October 7-11.

NATIONAL PAPER TRADE ASSOCIATION, annual Fall Meeting, Stevens Hotel, Chicago, Ill. September 23-25.

TREND OF BUSINESS

Business continues on a moderately improved level at this date, with the outlook for the next few months contingent on whatever major changes may occur in Europe, and with the long view somewhat less favorable than the present prospect for industry and trade. The indication of a more friendly attitude by the Administration toward business, through the removal of the rather drastic limitations of profits on defense contracts, is generally viewed as the expression of a more conciliatory relationship between government and business. It is expected that the urgencies of the national defense program, to which is attributed a more cooperative spirit by the Administration, will result in relaxation of restraints under the Administration's ruling and anti-trust laws.

This disposition to afford business a fair opportunity is a piece of constructive news for industry, which has long complained that the laws created by the New Deal have hampered normal operations. The fallacy of reasoning shown by the Administration in its haste to eliminate the possibility of large profits in armaments, is shown in the Vinson-Trammel Act, which limited profits on aircraft to 10 per cent and profits on naval ships to 12 per cent. The recently adopted Navy Act lowered the maximum profit on aircraft and naval orders let through competitive bidding to 8 per cent, while contracts negotiated on a fixed-fee basis were limited to 7 per cent of costs.

This drastic limit of profits while theoretically attractive in preventing large profits by a comparatively few, was so unsound in its effect on essential productive facilities urgently required for national defense, that the Administration was persuaded that the plan of eliminating profits so sharply would not only not reduce government expenses, but would tend to increase them by putting a premium on inefficient production. The argument was explained in this manner: When profits are limited to a percentage of costs, business is provided with an incentive to increase those costs on the theory that 7 per cent of $1,000,000 is more than 7 per cent of $500,000. When profits are not limited, however, business is encouraged to reduce costs and improved efficiency in production is likely to follow. Another factor undoubtedly considered in the Administration's decision to remove limits on profits was the fact that defense orders must be filled by many sub-contractors, such as manufacturers of special instruments, etc., and with a low profit only possible on government orders, manufacturers would prefer to continue on private orders. It is the expectation, of course, that the proposed excess-profits tax will prevent profiteering on national defense orders and business, we are informed, is being consulted in details of this impending legislation.

A more constructive attitude toward business is also seen in the new amortization policy adopted by the Administration, which will permit firms expanding plants for armament orders, to write off cost in five years, instead of ten years. The effect of this policy will permit private firms to recover defense expenses through the proceeds of defense orders, and industrial leaders were consulted in formulating the plan. Yet another encouraging feature in the attitude of the Administration is the tendency of the Administration to relax the present rigid requirements of anti-trust laws where they interfere with defense plans. It has been stated that the Department of Justice will not in future prosecute technical anti-trust violations in cases where industries are certified by the Defense Commission to be cooperating with the national defense program. The New Deal is like wise adopting a new attitude toward strikes by the imposition of a system of compulsory mediation, in which the CIO and AFL unions are cooperating with the Government, and which threatened strikes have already been prevented in key industries. Easing of the more rigid rulings of the Wage-Hour Law and a provision in the Navy Act to permit the President to suspend operation of the Walsh-Healey Act, requiring a 40-hour week on government orders, are encouraging tokens that the Administration is taking a less hostile attitude toward business and showing a more reasonable, cooperative spirit.

Current business opinion on the outlook for the remainder of this year is of a mixed character but the general view of the situation appears to concede that the large expenditures for national defense will

offset for some time the unfavorable state of export markets and the uncertain trend of international trade. The political and economical phases of the European situation continue to loom large in their potential effects on even the western hemisphere. Despite the uncertainty of the future and the possibility of a drastic shift in the balance of power in Europe, the outlook in this country is favorable. It may be interesting to note that paper and pulp firms were among the first 100 firms reporting earnings for the first half of 1940 aggregating net income of $113,658,828, representing a gain of 60.5 per cent over the $70,818,876 reported for the same period last year. Earnings of the Kimberly-Clark Corporation were reported at $1,373,651, compared with $1,263,581 for 1939; Sound Pulp Company, $1,161,223, compared with $132,382 last year, and the Container Corporation of America, $1,128,735, compared with $32,249 for the first half of 1939.

Although the outlook for the future is admittedly uncertain the consensus of authoritative opinion appears favorable for the continuation of industry and trade at a high level. The Federal Reserve Board's index of industrial production for June was 114 and is expected to advance during this month, with perhaps a recession in activity during August. It is believed, however, that any decline will be slight and that industry and trade will moderately expand during the seasonally active months of this Fall.

Union Bag Increases Wages

HUDSON FALLS, N. Y., July 20, 1940—Announcement is made here by the Union Bag and Paper Company that an increase in wages has been granted to its 1,200 employees. The announcement last week stated that the management has decided to increase the wages of all hourly paid employees receiving less than fifty cents per hour about four cents and all hourly paid employees receiving fifty cents and over will be increased three cents per hour. The increase will affect mechanics five cents an hour, machinists, five cents, millwrights, five cents, pipers, five cents, electricians, four cents, and cutters, two cents. Machine boys and label boys will be increased three cents per hour, machine tenders, three cents, machinists and machine apprentices, four cents, patternmakers, millwrights, carpenters, electricians, pipe-fitters, and blacksmiths, four cents. All piece work rates will be increased five per cent. The new wage scale will be placed in effect immediately.

Motor Rate Suspension Asked

INDIANAPOLIS, Ind., July 22, 1940—The Indiana Public Service Commission has ordered temporary suspension of a new schedule of rates of the Indiana Motor Rate and Traffic Bureau, Inc., for trucking of pulpboard from Wabash to Lafayette, Ind. Suspension was asked by the American Association of Railroads in behalf of 16 railroads in this area on the grounds that it would give trucks undue advantage. The commission set a hearing date for September 11.

Production Ratio Report

These statistics are based upon paper production reports to the American Paper and Pulp Association.

COMPARATIVE MONTHLY SUMMARIES[1]

Months	1940	1939	1938	1937	1936	1935	1934
January	90.2%	77.5%	63.9%	90.3%	76.1%	65.8%	.....
February	86.2%	81.7%	68.7%	90.1%	77.9%	70.0%	.....
March	83.9%	84.0%	69.6%	90.3%	76.0%	70.5%	.....
April	86.3%	82.9%	68.3%	92.1%	82.3%	70.0%	.....
May	91.7%	80.2%	69.0%	90.6%	81.6%	69.4%	.....
June	94.7%	79.7%	66.0%	87.3%	80.7%	72.3%	.....
July	.....	75.2%	72.0%	81.8%	77.3%	64.9%	.....
August	.....	82.9%	77.2%	82.9%	81.5%	70.9%	.....
September	.....	88.7%	76.3%	78.6%	80.5%	71.9%	58.2%
October	.....	96.6%	82.5%	73.5%	87.6%	75.6%	64.7%
November	.....	97.2%	79.6%	61.9%	88.0%	75.3%	61.7%
December	.....	91.1%	74.4%	54.5%	85.9%	71.2%	59.6%
Year Average	.....	84.9%	72.3%	80.6%	81.3%	70.5%	.....
First 28 weeks	88.4%	80.2%	67.6%	89.2%	78.7%	68.8%	.....

COMPARATIVE WEEKLY SUMMARIES[1]

CURRENT WEEKS, 1940		CORRESPONDING WEEKS, 1939	
June 8	93.6%		
June 15	94.7%	June 10	79.3%
June 22	95.9%	June 17	79.0%
June 29	94.7%	June 24	79.2%
July 6 (Holiday Week)	70.1%	July 1	81.2%
*July 13	93.0%	July 8	56.3%
		July 15	81.8%

The following statistics show the number of mills reporting by ratio groups:

	Number of Mills Reporting—Current Weeks					
Ratio Limits	June 8, 1940	June 15, 1940	June 22, 1940	June 29, 1940	July 6, 1940	July 13, 1940
0% to 50%	36	38	38	28	102	31
51% to 100%	251	248	249	254	176	204
Total Mills Reporting	287	286	287	282	278	235

PAPERBOARD OPERATING RATIOS

Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1936	62%	67%	67%	70%	69%	70%	69%
1937	80%	86%	86%	88%	85%	77%	66%
1938	54%	60%	61%	57%	58%	56%	57%
1939	60%	67%	71%	69%	64%	67%	63%
1940	71%	70%	69%	70%	76%	79%	.....

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1936	75%	78%	82%	80%	74%	72%
1937	74%	69%	65%	55%	45%	73%
1938	66%	66%	70%	65%	59%	61%
1939	72%	74%	84%	81%	71%	70%
1940	.....	.....	.....	.....	.....	.....

Week end. June 8, 1940—77%
Week end. June 15, 1940—79%
Week end. June 22, 1940—79%
Week end. June 29, 1940—80%
Week end. July 6, 1940—60%
Week end. July 13, 1940—72%

[1] Production-capacity ratios are based upon six-day capacity ratings which are adjusted periodically to correspond with the ratings reported by individual companies. Ratios are subject to revision until all reports are received.

* Preliminary figure.

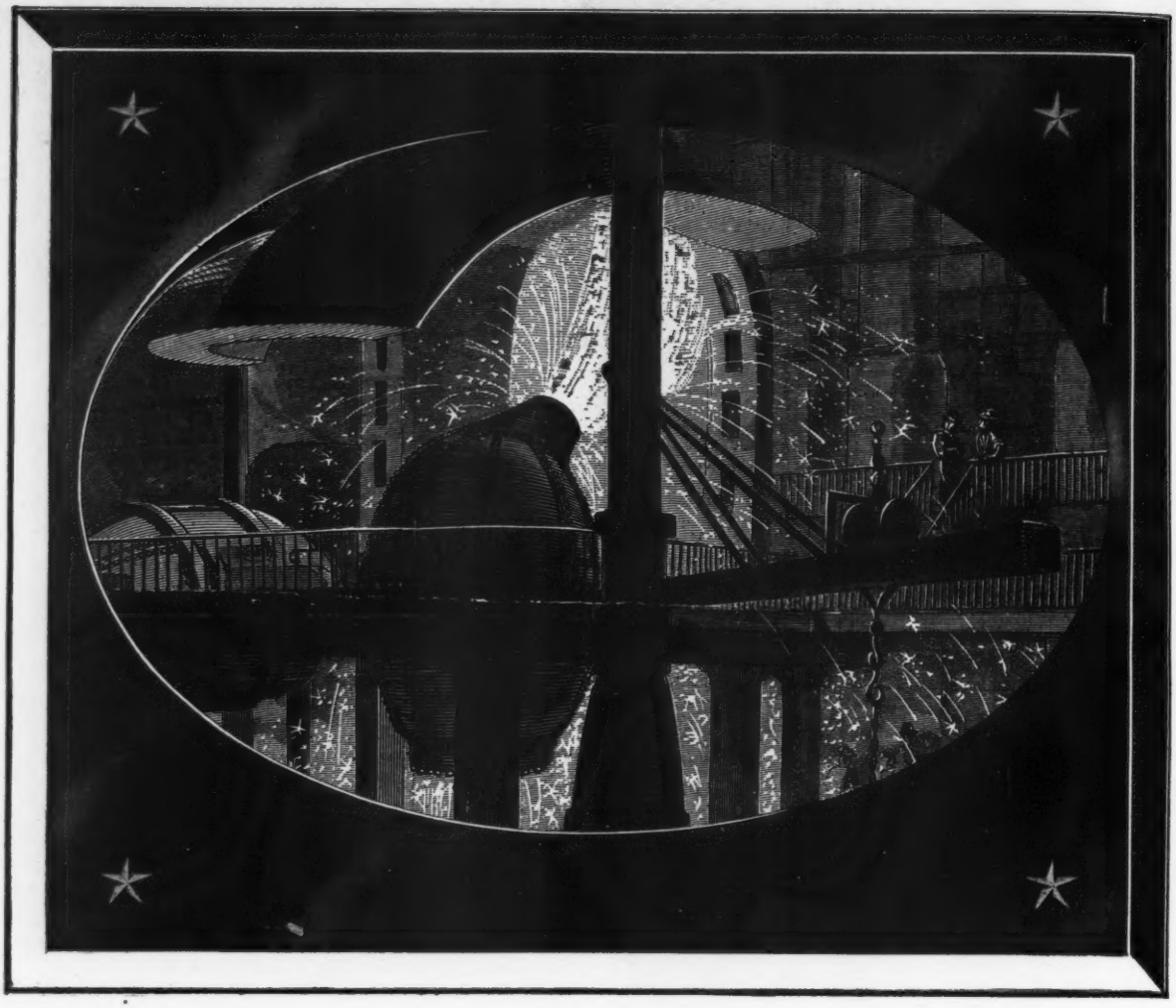
Champion Plant Speeds Operation

[FROM OUR REGULAR CORRESPONDENT]

HOUSTON, Texas, July 22, 1940—The Champion Paper and Fibre Company's new Pasadena, Texas, mill was operating at its capacity production peak of 120 tons of printing paper daily as the first month of operations for its new production unit drew to a close.

The addition to the Pasadena pulp mill, which opened in 1937, brings Champion's production here to 260 tons of pulp paper daily and 120 tons of printing paper. The paper and pulp is made from Southern pine, most of which is cut in the immediate area of Houston.

The number of employees since completion of the new paper machine, has been boosted to near the 600 mark, with an increase of about 150 men, according to W. R. Crute, mill manager. Company officials estimate the increase in payroll will amount to $400,000 annually.



They Started Something!

WHEN Henry Bessemer and William Siemens devised their processes for the rapid, economical production of steel from pig iron, they gave to steel the impetus it needed to attain its position as one of the most important of all engineering materials. For steel had been known to the early artisans of Damascus and Toledo—yet its high cost had limited its industrial utility. The low-cost production processes that made steel a commercially practicable material immediately increased its usefulness. And the increased demand in turn made possible the financing of further research, which has resulted in the wide range of alloy steels available today. Almost every basic industry makes extensive use of steel—as a raw material or as a vital part of building structures and manufacturing equipment.

The first cylinder of Liquid Chlorine made by EBG in 1909.

Chlorine, too, was known for years before it attained its merited utility. When EBG engineers produced Liquid Chlorine for the first time in America, they made chlorine available in a form in which its properties could be successfully employed commercially. Municipalities throughout the country found in Liquid Chlorine an effective means for safeguarding public health by the purification of water supplies and the sterilization of sewage. And manufacturers of paper and textiles recognized the advantages of Liquid Chlorine as an efficient, economical bleaching agent. Pioneers in the production of Liquid Chlorine, EBG engineers have an unmatched background of experience in its manufacture. *You* can profit by that experience.

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Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

United States Patents on Papermaking

Second Quarter, 1940

Compiled by Clarence J. West, Chairman, TAPPI Committee on Abstracts and Bibliography

The following list of patents has been compiled from the current numbers of the Official Gazette of the United States Patent Office. Since, as a rule, only one claim is published in the Gazette, it is not claimed that the list is complete; it is also possible that some patents have been included which do not apply to papermaking.

Copies of any of the following patents may be obtained from the U. S. Patent Office, Washington, D. C., by sending ten cents for each patent desired. The number, name of inventor and title of patent should be given in the request. Books of coupons may be purchased for $2.00 or $10.00, good for 20 or 100 patents. Coupon orders do not have to be accompanied by letters of transmittal. In any case, personal checks and postage stamps are not accepted.

April 2, 1940

2,195,396. Process of purifying cellulose materials. Nils W. Coster, assignor to Soundview Pulp Company, Everett, Wash. Filed Oct. 22, 1937. 3 claims. (Cl. 8-105). A suspension of pulp is treated with chlorine gas and, after absorption of the gas, with a hypochlorite solution at such rate as to be instantly converted into hypochlorous acid; the quantity used is such that, when exhausted, the cellulose will have an orange color.

2,195,583. Apparatus for forming bags. Charles F. Schultz and Ira E. Schultz, Oakland, Calif. Filed April 25, 1938. 3 claims. (Cl. 93-18). An apparatus for forming bags from confronting sheets of fusible material.

2,195,600. Method of sizing paper. Arthur Reilly, assignor to S. D. Warren Company, Boston, Mass. Filed Oct. 15, 1936. 6 claims. (Cl. 92-21). Method of sizing paper containing alkaline filler which uses a rosin size at least 45% of the rosin content of which is saponified, said rosin size containing a protective colloid of the group consisting of blood albumen, casein, corn protein, gelatin, glue, locust bean gum, oxidized starch and soybean protein in quantity amounting to at least 4 per cent of the weight of rosin in the rosin size.

2,195,680. Apparatus for continuous treatment of wood pulp, cellulose, and similar material with bleaching liquid, alkali, or other chemicals. Johan Christoffer Fredrik Carl Richter, assignor to Aktiebolaget Kamyr, Oslo, Norway. Filed Dec. 1, 1936. 2 claims. (Cl. 92-7). A substantially vertical U-shaped channel with large, substantially uniform unobstructed cross section and devoid of mechanical conveying devices, one section of the channel being provided for means for supplying materials and chemicals, the other section being provided with an overflow for continuously removing the material treated.

2,195,740. Forming and filling bags. Leroy L. Salfisberg, assignor to Ivers-Lee Company, Newark, N. J. Filed July 27, 1938. 6 claims. (Cl. 93-3).

2,195,916. Egg carton assembling machine. Arthur Edmund Brown and William Vaughan, assignors to Leon Benoit, New York, N. Y. Filed Dec. 10, 1938. 32 claims. (Cl. 93-37).

2,195,959. Covering material folding and applying machine. William T. Maguire, assignor to William Exline, Inc., Cleveland, Ohio. Filed March 23, 1937. 3 claims. (Cl. 154-41). A folder and means for advancing cover units composed of filler board and protruding cover material to the folder.

2,195,980. Recovery of sulphur dioxide. Raymond F. Bacon and Rocco Fanelli, New Rochelle, N. Y.; said Fanelli assignor to said Bacon. Filed Jan. 21, 1938. 7 claims. (Cl. 23-178). An aqueous solution containing borax is used to absorb the sulphur dioxide and the solution is heated in the presence of boric acid to liberate the dioxide.

2,196,004. Recovery of sulphur dioxide. Raymond F. Bacon and Rocco Fanelli, New Rochelle, N. Y.; said Fanelli assignor to said Bacon. Filed Jan. 21, 1938. 9 claims. (Cl. 23-178). Sulphur dioxide is liberated from a solution by heating in the presence of boric acid in amount substantially sufficient to saturate the absorption liquid with respect thereto at the temperature of liberation of the dioxide.

2,196,085. Tubular paper manufacture. David C. Spaulding, Jr., assignor to The Standard Oil Company, Cleveland, Ohio. Filed June 30, 1937. 7 claims. (Cl. 93-94). Sheet cellulose is wound in tubular form, sheet cellulose having a filling of titanium dioxide is adhered thereto and the outside is coated with a wax and the inside with an oil-resistant liquid.

April 9, 1940

2,196,243. Sealing for paperboard containers. Duryea Bensel, assignor to Albert Borden, New York, N. Y. Filed March 27, 1937. 4 claims. (Cl. 229-17). A paperboard container having a pouring flap.

2,196,267. Fibrous roofing material. Arthur G. Leonard, Jr., assignor to The Lehon Company, Chicago, Ill. Filed Oct. 11, 1937. 11 claims. (Cl. 108-7). A felted fibrous sheet having alternating hard dense portions and relatively soft portions extending longitudinally of the sheet.

2,196,277. Molded lignocellulosic material and method of making same. Arlie W. Schorger and John H. Ferguson, assignors to Burgess Cellulose Company, Freeport, Ill. Filed April 1, 1937. 8 claims. (Cl. 260-9). The material is heated in water at 148 to 199° C., the water containing an alkaline substance giving a pH of approximately 4 to 6 in the cooked mass at the end of the cook, removing the water soluble material and drying the leached material, adding approximately 1 to 10 per cent by weight of an aromatic amine.

2,196,440. Manufacture of cartons. John Hoza, Zlin, Czechoslovakia. Filed May 31, 1938. 8 claims. (Cl. 93-51).

2,196,469. Reconstituted mineral surfaced felt and manufacture of same. William J. Moeller, Harold W. Greider, and Marion F. Smith, assignors to The Philip Carey Manufacturing Company, Lockland, Ohio. Filed Sept. 6, 1935. 18 claims. (Cl. 92-3). A felted product formed from thermoplastic substance treated fabric containing grit material, reconstituted in a sheet with the fabric and grit homogeneously mixed and ground together, the grit material being reduced in subdivided condition and the fibers being in felted relation.

2,196,489. Paper roll chuck. Franklin Pierce Bennett, Seattle, Wash. Filed June 5, 1937. 1 claim. (Cl. 242-72). An expansion chuck for use with a paper roll and its shaft.

2,196,496. Apparatus for the recovery of heat and chemicals from black liquor. Alexander Leopold Hamm, assignor to Combustion Engineering Company, Inc., New York, N. Y. Filed March 2, 1938. 4 claims. (Cl. 23-262). A water-wall lined recovery furnace and the necessary accessories.

2,196,633. Controlling flowing web. Robert McC. Johnstone, assignor to Cameron Machine Company, Brooklyn, N. Y. Filed March 23, 1939. 2 claims. (Cl. 242-76). A method of controlling the flow of the web through a processing mechanism which receives a web of flexible material from a web roll that is automatically shifted in either direction transversely of the web flow in response to the section of a control device located intermediate the processing mechanism and the web roll.

2,196,665. Method of making containers. George Arlington Moore, assignor to Humoco Corporation, Louisville, Ky. Filed May 26, 1937. 8 claims. (Cl. 93-39.1).

2,196,666. Method and means of making containers. George Arlington Moore, assignor to Humoco Corporation, Louisville, Ky. Filed Nov. 21, 1938. 14 claims. (Cl. 93-3).

2,196,692. Coating device. Alva Wayne Bateman, assignor to E. I. du Pont de Nemours & Company, Wilmington, Del. Filed March 9, 1938. 2 claims. (Cl. 91-53). The apparatus consists of two horizontal tables, the second of which is higher than the first, a rotatable doctor knife above each table and means for passing the fabric under each knife.

2,196,788. Nonbleeding blueprint and process of making the same. Harold J. Brunk and Morris Dickason, assignors to The C. F. Pease Company, Chicago, Ill. Filed July 29, 1937. 2 claims. (Cl. 95-6). Method of coating blueprint paper with a roller.

2,196,894. Coating equipment. Russell Boice, assignor to E. I. du Pont de Nemours & Company, Wilmington, Del. Filed April 21, 1938. 3 claims. (Cl. 91-48). Two supports over which the fabric passes and a plurality of undriven doctor rolls located between the supports and in contact with the moving fabric, the first of the rolls being the largest.

April 16, 1940

R21,424. Method of producing box or carton blanks bearing printed matter and resulting product. William F. Grupe, assignor to Chambon Corporation, Garfield, N. J. Original No. 2,048,693, dated July 28, 1936. Application for reissue June 13, 1938. 19 claims. (Cl. 93-36.6).

2,197,003. Process for making pigments. Kenneth S. Mowlds, assignor to The Glidden Company, Cleveland, Ohio. Filed Nov. 18, 1937. 16 claims. (Cl. 23-122). Method of preparing calcium sulphate.

2,197,089. Method and apparatus for making boxes. Nels A. Anderson, assignor to Fibreboard Products, Inc., San Francisco, Calif. Filed July 19, 1938. 43 claims. (Cl. 93-49).

2,197,112. Method of making bags. Thomas E. Piazze, assignor to Marshall & Ilsley Bank, Milwaukee, Wis. Filed Feb. 10, 1938. 6 claims. (Cl. 93-35).

2,197,182. Jordan filling. Harry M. Keating, assignor to Smith Paper, Inc., Lee, Mass. Filed Sept. 25, 1937. 10 claims. (Cl. 92-27). A construction in which the actual quantity of bar metal, measured circumferentially in any zone containing the distributed effective bar ends of a series, increases with increasing cone diameter and increases gradually across the zone.

2,197,260. Guide for paper cutters. Frank M. Pickett, assignor to Remington Rand, Inc., Buffalo, N. Y. Filed Sept. 1, 1939. 6 claims. (Cl. 164-47).

2,197,383. Sizing of paper. Charles R. Outterson, Syracuse, N. Y. Filed July 16, 1936. 8 claims. (Cl. 92-21). Uncombined alkali is removed from the size and a protective colloid is incorporated, with the addition of not more than 1 per cent by weight of the size of phenol and of formaldehyde and the size is coagulated by means of the alum and the phenol-formaldehyde.

2,197,447. Plaited crepe forming machine. William H. Cannard, Green Bay, Wis. Filed Oct. 20, 1936. 17 claims. (Cl. 154-30). The web corrugations are pressed only after passage around a portion of the press rolls.

2,197,463. Papermaking. Donald B. Bradner, assignor to The Champion Paper and Fibre Company, Hamilton, Ohio. Filed Sept. 8, 1936. 1 claim. (Cl. 92-21). A method of gelatinizing starch in the paper web by the application of steam and the exclusion of air.

2,197,724. Resinous molding composition from synthetic aldehyde resins and hydrolyzed ligno-cellulose. Almon G. Hovey and Theodore S. Hodgins, assignors to Reichhold Chemicals, Inc., Detroit, Mich. Filed July 26, 1939. 4 claims. (Cl. 260-9). The method consists of partially cocondensing the ingredients of thermosetting synthetic aldehyde resins with the lignin component of wet hydrolyzed lignocellulose and subsequently dehydrating the product and forming the resin.

April 23, 1940

2,197,754. Process for combining cloth and paper. Jordan V. Bauer and Don M. Hawley, assignors to Stein, Hall Manufacturing Company, Chicago, Ill. Filed Aug. 18, 1937. 4 claims. (Cl. 154-40). Use of a suspension of a relatively uniform layer of a nonadhesive ungelatinized starch in a viscous gelatinized starch carrier on the surface of the paper and imbedding the individual fibers of the cloth in this layer and then gelatinizing the starch with heat.

2,197,782. Container making machine. Cesare Barbieri, assignor to Dixie-Vortex Company, Chicago, Ill. Filed Sept. 25, 1937. 29 claims. (Cl. 93-36.2). An impacting mechanism designed to blunt the sharp apex of the container without materially altering the shape of the container.

2,197,822. Panelboard and method of making same. Frederick P. Wood, assignor to Simplex Paper Corporation, Adrian, Mich. Filed May 28, 1936. 5 claims. (Cl. 92-3). Fiberboard which has been previously impregnated with asphalt is cooked and beaten and run over a paper machine.

2,197,823. Moisture meter and controller. George Harold Young, Dayton, Ohio. Filed April 22, 1935. 24 claims. (Cl. 34-48). A system for controlling the moisture content of work material passing over a drying cylinder.

2,197,878. Surfacing machine. Samuel S. Robinson, Passaic, N. J. Filed July 24, 1937. 7 claims. (Cl. 94-44). A surface coating machine.

2,197,879. Paper laying machine. Samuel S. Robinson, Passaic, N. J. Filed July 24, 1937. 7 claims. (Cl. 91-30). A machine for laying a strip of paper on a predetermined surface.

2,198,065. Process for purifying wood pulp. Lyle Melvin Sheldon and Lionel Elmer Goff, assignors to The Cellulose Research Corporation, East Alton, Ill. Filed Nov. 27, 1936. 2 claims. (Cl. 92-13). Pulp is treated with 13-15 per cent of sodium hydroxide at 25-30° C. for a time sufficient to dissolve the soluble non-alpha cellulose constituents and render the fibers highly swollen and porous and then washing the pulp at a rate sufficiently rapid to remove the more dilute caustic concentrations below 7 per cent in less than thirty minutes so as to maintain the highly swollen porous condition of the fibers in the washed pulp.

2,198,066. Adhesive applying mechanism for envelope blanks and the like. Edwin G. Staude, Minneapolis, Minn. Filed July 29, 1938. 19 claims. (Cl. 91-50).

2,198,086. Match booking machine. Wilmer C. Nicodemus, assignor to The Diamond Match Company, New York, N. Y. Filed June 7, 1939. 10 claims. (Cl. 93-2).

2,198,094. Method and apparatus for making collapsible boxes. Carl R. Swafford, assignor to Old Dominion Box Company, Lynchburg, Va. Filed March 9, 1939. 16 claims. (Cl. 93-49).

2,198,095. Process of producing thick butt shingles and such shingles. Benjamin Sweedler, assignor to The Patent and Licensing Corporation, New York, N. Y. Filed Oct. 11, 1935. 1 claim. (Cl. 91-70). Process of making thick butt shingles each having tabs along one longitudinal edge and separated by tab-defining cutouts.

2,198,223. Preparation of calcium carbonate. Irving E. Muskat and Frederick Gage, assignors to Pittsburgh Plate Glass Company, Allegheny County, Pa. Filed Aug. 10, 1938. 21 claims. (Cl. 23-66). A relatively coarse alkaline earth metal carbonate is digested with a concentrated solution of an alkali metal hydroxide.

2,198,232. Process of manufacturing a water-laid felt. Henry Philip Shopneck, New York, N. Y. Filed Nov. 15, 1938. 4 claims. (Cl. 92-3). The stock constituting substantially the short-fibered portion is beaten in an aqueous medium, screened, mixed with the relatively longer fibers and sheeted on a paper machine.

2,198,269. Manufacture of compressed cellulosic or wood products. Harry K. Linzell and Joseph W. Gill, assignors to United States Gypsum Company, Chicago, Ill. Filed May 2, 1934. 7 claims. (Cl. 92-61). Dry cellulosic material is subjected to a temperature of at least 400° F. under impacting pressure which is applied by means of a member having a pressing surface of black magnetic iron oxide.

2,198,289. Sizing composition and process of preparation. Oscar F. Neitzke, assignor to Bennett Incorporated, Cambridge, Mass. Filed June 9, 1937. 4 claims. (Cl. 134-21). A hydrocarbon-wax mixture is heated above the melting points of its components and dispersed in an aqueous medium containing a soluble dispersion-stabilizer, such as neutral salts of sulphonic acids and water-soluble gum of the nature of gum arabic.

2,198,387. Paper making machine. Sigbjörn Paul Herbert Ebbinghaus Holgersson, Hammarby, Storvik, Sweden. Filed April 27, 1937. 2 claims. (Cl. 92-49). Combination of a press, consisting of two cooperating press rolls, and a steam box; the pulp web is subjected to the action of the steam before it passes through the press.

2,198,446. Waste liquor recovery apparatus. Leslie S. Wilcoxson, assignor to The Babcock and Wilcox Company, Newark, N. J. Filed Aug. 22, 1936. 3 claims. (Cl. 23-277). A recovery furnace having means for burning waste liquor and liquefying the incombustible constituents.

2,198,460. Method and apparatus for folding paper and the like. Fay E. Rickard, Chicago, Ill. Filed Nov. 29, 1938. 7 claims. (Cl. 270-62).

2,198,587. Method of and apparatus for packing wood chips or the like. Harold A. Skinner, assignor to Marathon Paper Mills Company, Rothschild, Wis. Filed July 15, 1938. 14 claims. (Cl. 214-17). The stream of chips is divided into a plurality of spaced streams and are packed in a plurality of packed segments extending vertically within the digester, with the abutting faces of the segments extending substantially radially of the cross section of the digester to provide radial and vertical channels for circulating fluids through the material.

April 30, 1940

2,198,601. Roof and siding material. Lorrin T. Brownmiller, assignor to Bakelite Building Products Co., Inc., New York, N. Y. Filed July 11, 1935. 9 claims. (Cl. 91-68). A product with a cellular structure bonded to a base.

2,198,706. Refining wood pulp. Lyle M. Sheldon, Lionel E. Goff, Dwight A. Alderson, and George N. Fisher, assignors to The Cellulose Research Corporation, East Alton, Ill. Filed Nov. 23, 1936. 4 claims. (Cl. 8-105). Sulphite pulp is defibered, treated with chlorine equivalent to 14-18 per cent of the bleach value, and subjected to the action of an alkaline solution having a pH greater than 9 and a concentration of less than 7 per cent for thirty to sixty minutes at a temperature above 70° C.; the bleach value is reduced to below 5 per cent.

2,198,709. Pulp bleaching apparatus. George H. Tomlinson, Westmount, Quebec, Canada. Filed Oct. 30, 1937. 4 claims. (Cl. 68-27). A mixing device, a tall downflow bleaching tower, and a tall upflow tower, each of the towers being provided with an internal partition affording a substantially horseshoe-shaped open top circulating channel in the bottom portion of the tower.

2,198,732. Device for the automatic partition in varying dimensions, for advacing the reams of paper in paper-cutting machines. Emile Langenhagen, Roubaix, France. Filed May 13, 1939. 5 claims. (Cl. 164-59).

2,198,766. Method of making flexible abrasives. Francis E. Gallagher, assignor to Behr-Manning Corporation, Troy, N. Y. Filed Dec. 22, 1932. 9 claims. (Cl. 51-295). Abrasive particles are deposited on an adhesively-coated backing sheet, a layer of adhesive sizing is added and then another layer of adhesive sizing upon the first layer.

2,198,855. Method of making infolded knock-down boxes. Samuel Bergstein, Cincinnati, Ohio. Filed Oct. 24, 1938. 6 claims. (Cl. 93-49).

2,198,885. Composite thermal insulating unit. Manley R. Price, assignor to The Celotex Corporation, Chicago, Ill. Filed April 21, 1932. 5 claims. (Cl. 154-45.9). A wallboard, comprising a substantially rigid skeleton having interstices therein, sheet material enveloping the skeleton and granular highly porous calcium silicate in and retained in the interstices of the skeleton by said sheet material.

2,198,886. Moistureproofing of regenerated cellulose. Charles Forbes Silsby, assignor to The Solvay Process Company, Syracuse, N. Y. Filed Aug. 16, 1937. 4 claims. (Cl. 91-68). A fusible succinic acid-glycerol resin is used.

2,199,005. Tape applying and cutting apparatus. Esli A. Marsh, assignor to St. Regis Paper Company, New York, N. Y. Filed Dec. 6, 1937. 12 claims. (Cl. 112-11). Apparatus for closing bag ends.

2,199,137. Rotary beater for the preparation of asbestos fibers and the like. Alessandro Magnani, assignor of one-half to F. L. Smidth & Co. A/S, Copenhagen, Denmark. Filed Feb. 9, 1937. 3 claims. (Cl. 83-11).

2,199,193. Waterproofing compound. Emile L. Baldeschwieler and Peter J. Wiezevich (Peter J. Gaylor), assignors to Standard Oil Development Company, Elizabeth, N. J. Filed Aug. 19, 1936. 1 claim. (Cl. 134-78.5). A waterproofing composition for building materials composed of paraffin wax, 10 to 20 per cent drying petroleum oil, 0.1 per cent of paint drier and approximately 65 per cent of heavy naphtha.

2,199,224. Oilproof material. Everett C. Hughes, assignor to The Standard Oil Company, Cleveland, Ohio. Filed June 21, 1937. 1 claim. (Cl. 91-68). An oil and greaseproof container structure having its wall of at least one layer of sheet cellulose and an inside coating of a composition of approximately 50 per cent oxidized abietic acid, 17 per cent castor oil and 3 per cent of ethyl alcohol.

2,199,228. Method of and apparatus for coating paper. Noel Obenshain and Wright M. Welton, assignors to West Virginia Pulp and Paper Company, New York, N. Y. Filed July 16, 1936. 6 claims. (Cl. 91-50). An indented metal roll receives the initial coating color and a resilient receiving roll contacts the web and moves with respect to the web.

2,199,368. Blueprint coating. Robert Bowling Barnes and Garnet Philp Ham, assignors to American Cyanamid Company, New York, N. Y. Filed June 14, 1939. 8 claims. (Cl. 95-6). The coating contains an amidine salt of a sulfodicarboxylic acid ester.

2,199,376. Bleaching of groundwood pulp. Joseph S. Reichert, Samuel A. McNeight, and Howard L. Potter, assignors to E. I. du Pont de Nemours & Company, Wilmington, Del. Filed Sept. 29, 1939. 8 claims. (Cl. 8-104). The pulp is treated with an alkaline peroxide solution at 80 to 120° F., the pH during the major part of the operation being maintained between 10 and 11.

May 7, 1940

2,199,417. Method of making a Fourdrinier wire. Andrew Purves, Holyoke, Mass. Filed Oct. 19, 1938. 2 claims. (Cl. 28-1). A weft wire with a plurality of non-ferrous warp wires so woven as to provide a relatively thin selvage edge as compared with the thickness of the main body of the fabric.

2,199,455. Suction roll. Earl E. Berry, assignor to Beloit Iron Works, Beloit, Wis. Filed Dec. 24, 1936. 7 claims. (Cl. 92-53). A method for varying the width of the suction area.

2,199,597. Manufacture of laminated sheets. Archibald Renfrew and William Elliott Frew Gates, assignors to Imperial Chemical Industries Limited. Filed Dec. 29, 1936. 3 claims. (Cl. 154-40). The base material in sheet form is treated with an adhesive comprising essentially a methacrylic acid ester monomer-polymer mixture and then with a polymeric ester of methacrylic acid in powdered form.

2,199,653. Process of treating tall oil. Ernest Segessemann, assignor to National Oil Products Company, Harrison, N. J. Filed July 7, 1938. 14 claims. (Cl. 260-103). The fatty acids are esterified with a low boiling alcohol and the resin acids later esterfied with an alcohol with a higher boiling point than the first alcohol.

2,199,743. Guard for paper cutter. Walter C. Eickman, assignor to Harris-Seybold-Potter Company, Cleveland, Ohio. Filed Dec. 21, 1938. 13 claims. (Cl. 74-615).

2,199,750. Process of making paper. Howard D. Meincke, assignor to A. M. Meincke & Son, Inc., Chicago, Ill. Filed Feb. 17, 1937. 1 claim. (Cl. 92-21). A readily dispersible starch (produced by heating starch under pressure with 4 to 5 times its volume of water and drying) is added to the beater, the pH being maintained at about 7 by addition of sodium silicate; alum is then added to reduce the pH to about 5 and the mixture formed into paper.

2,199,752. Coated abrasive. Nicholas E. Oglesby, assignor to Behr-Manning Corporation, Troy, N. Y. Filed Feb. 6, 1937. 17 claims. (Cl. 51-278). A method of softening the adhesive on the backing sheet to produce a surface zone in the coating which is more fluid than the main body.

2,199,862. Manufacture of papers having low affinity for adhesives. Florian Strovink, assignor to Bennett Incorporated, Cambridge, Mass. Filed Sept. 10, 1938. 10 claims. (Cl. 91-68). The paper carries as a distinct entity an exposed soap film and is infused at least at its surface fibers underlying the soap film with wax and water-wettable binder, thus preventing penetration of the paper by the soap film.

2,199,936. Hypochlorous acid solution and method of making same. Hans O. Kauffmann, assignor to Buffalo Electro-Chemical Company, Inc., Buffalo, N. Y. Filed Feb. 10, 1937. 5 claims. (Cl. 23-152). A metal phosphate and a metal hypochlorite in aqueous solution is acidified with sulphuric acid to a pH between 7 and 4.5.

2,200,000. Art of winding flexible material. Robert McC. Johnstone, assignor to Cameron Machine Company, Brooklyn, N. Y. Filed Sept. 10, 1937. 4 claims. (Cl. 242-56).

2,200,002. Paper making machine. Gerould T. Lane and Wendell Butterfield, assignors to

Eastman Kodak Company, Rochester, N. Y. Filed Jan. 16, 1937. 10 claims. (Cl. 92-43). An apparatus for accurately controlling the flow of pulp over a machine employing a making drum and a wire.

2,200,034. Method and apparatus for digesting cellulosic materials. Albert D. Merrill, Watertown, N. Y. Filed Aug. 8, 1935. 11 claims. (Cl. 92-7). A continuous process in which the raw material is contacted in the first stage with hot acid maintained just below the reaction temperature and under a high hydrostatic pressure.

2,200,155. Manufacture of wallboard having a cementitious core. Thomas P. Camp and John Page, assignors to United States Gypsum Company, Chicago, Ill. Filed Nov. 21, 1936. 9 claims. (Cl. 154-2). A slurry of calcined gypsum and water is spread on a paper web, a cover sheet of paper is added and the gypsum allowed to set.

2,200,160. Paper roll. Charles Davis, assignor to West Virginia Pulp and Paper Company, New York, N. Y. Filed Sept. 9, 1938. 1 claim. (Cl. 206-59). A roll of coated paper for use in printing presses with minute longitudinally extending irregularities in thickness or ridges extending along a uniform sinusoidal path and the corresponding ridges in adjacent layers being in offset or staggered relation to each other.

2,200,238. Method of making infolded knockdown boxes. Samuel Bergstein, Cincinnati, Ohio. Filed Oct. 26, 1939. 6 claims. (Cl. 93-49).

MAY 14, 1940

2,200,289. Container and method of making the same. George Arlington Moore, assignor to Humoco Corporation, Louisville, Ky. Filed Sept. 10, 1938. 9 claims. (Cl. 93-36).

2,200,295. Method of assembling containers. John F. Peters, assignor to American Can Company, New York, N. Y. Filed Nov. 4, 1938. 3 claims. (Cl. 93-55.1).

2,200,313. Method of closing bags. Hans Volksvorf, assignor to Thomas M. Royal & Company, Philadelphia, Pa. Filed Aug. 31, 1936. 2 claims. (Cl. 93-6).

2,200,341. Covering material. Chester E. Rahr, assignor to Certain-Teed Products Corporation, New York, N. Y. Filed Jan. 8, 1938. 13 claims. (Cl. 108-7). A sheet of felted material having upon a face thereof a plurality of portions of the felled structure raised above the face of the sheet to form separated projections.

2,200,360. Container forming mechanism. Martin Heres, assignor to Eppens, Smith Company, Inc., New York, N. Y. Filed March 17, 1939. 7 claims. (Cl. 93-7). A bag-forming and filling machine.

2,200,410. Paper making machinery. Joseph E. Bond, Middletown, Ohio. Filed Oct. 19, 1938. 5 claims. (Cl. 92-20). An apparatus for disintegrating and agitating pulp.

2,200,468. Recovery of by-products from black liquor. Francis J. Cirves, Crossett, Ark. Filed Aug. 8, 1938. 9 claims. (Cl. 260-97.5). Air is introduced into a stream of black liquor so as to agglomerate to soapy particles, the soap is separated by gravity and hydrolyzed to form tall oil.

2,200,481. Paper window shade. Arthur L. Thexton, assignor to Clopay Corporation, Cincinnati, Ohio. Filed April 7, 1938. 2 claims. (Cl. 41-20). A method of printing and coating paper for use as a window shade.

2,200,622. Deinking of printed paper. Pierre R. Hines, Portland, Oreg. Filed Aug. 19, 1936. 1 claim. (Cl. 92-13). In deinking with alkaline liquor and flotation, the leaching time is limited to thirty minutes and the washing time to forty-five minutes; burnt lime is added prior to the separation of the ink particles.

2,200,650. Composite board. Arthur R. Welch, Hoquiam, Wash. Filed April 10, 1937. 4 claims. (Cl. 154-2). Discrete wood particles and a resin binder are used as an interior filling between two sheets of plyboard.

2,200,784. Flocculating aqueous liquid. Frederick J. Wallace, assignor to Robeson Process Company, New York, N. Y. Filed Jan. 12, 1939. 8 claims. (Cl. 210-2). Alkalized recovered lignin is used as the clarifying agent for an aqueous liquid carrying suspended matter of colloid fineness.

2,200,839. Water-resistant laminated paper and method of manufacture. Louis C. Fleck, assignor to Paper Patents Company, Neenah, Wis. Filed June 29, 1936. 6 claims. (Cl. 154-40). Two sheets are used, one coated with an alkaline solution of a potentially water-resistant casein adhesive and the other with a starch adhesive containing an agent adapted to render the casein adhesive water-resistant.

2,200,905. Web splicing device. Henry A. Wise Wood, assignor to Wood Newspaper Machinery Corporation, New York, N. Y. Filed Nov. 13, 1934. 13 claims. (Cl. 242-66).

2,201,001. Machine for making Jordan shell linings. Harold D. Stuck, assignor to John W. Bolton & Sons, Inc., Lawrence, Mass. Filed Dec. 31, 1935. 5 claims. (Cl. 29-84).

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2,201,175. Building material and the like. Norman P. Harshberger, assignor to Bakelite Building Products Co., Inc., New York, N. Y. Filed April 17, 1937. 9 claims. (Cl. 108-8).

2,201,177. Fiber container manufacture. John M. Hothersall, assignor to American Can Company, New York, N. Y. Filed Dec. 9, 1938. 5 claims. (Cl. 93-39.1).

2,201,184. Slitting mechanism for box making machines. Cutler D. Knowlton, assignor to Hoague-Sprague Corporation, Lynn, Mass. Filed Aug. 26, 1938. 6 claims. (Cl. 164-28).

2,201,185. Method of making box blanks and boxes. Cutler D. Knowlton, assignor to Hoague-Sprague Corporation, Lynn, Mass. Filed May 24, 1939. 2 claims. (Cl. 93-36).

2,201,194. Method and apparatus for manufacturing granular coated webs. Romie L. Melton, Raymond C. Benner and Henry P. Kirchner, assignors to The Carborundum Company, Niagara Falls, N. Y. Filed Sept. 23, 1933. 16 claims. (Cl. 91-68). A base coat of wet adhesive is applied to a flexible web, a layer of abrasive grain is applied and a sizing coating of liquid adhesive is sprayed by means of a gaseous vehicle containing a solvent for the adhesive.

2,201,195. Granular coated material. Romie L. Melton, Raymond C. Benner and Henry P. Kirchner, assignors to The Carborundum Company, Niagara Falls, N. Y. Filed Sept. 22, 1933. 4 claims. (Cl. 51-185). A granular coated web having granular particles adhesively attached to a web backing material and further supported by an additional layer of adhesive deposited around the bases of the particles.

2,201,196. Manufacture of granular coated materials. John A. Williamson, assignor to The Carborundum Company, Niagara Falls, N. Y. Filed June 27, 1939. 8 claims. (Cl. 51-278). A layer of liquid adhesive of excess thickness is applied to the granular surface of a web previously coated with granular particles, and the excess adhesive is removed by a high velocity stream of gas.

2,201,276. Filler for pulp refining engine. Charles J. Steinbarger, assignor to Simonds Worden White Company, Dayton, Ohio. Filed Aug. 8, 1939. 11 claims. (Cl. 92-27). A plurality of stuff reducing members extending lengthwise of the filler and spaced laterally one from the other, each reducing member having adjacent longitudinal portions inclined laterally in opposite directions and arranged to form tortuous passageways between adjacent members.

2,201,457. Moistureproof sausage casing and method of making same. John Paul Smith and William Franklin Henderson, assignors to The Visking Corporation, Chicago, Ill. Filed May 3, 1937. 12 claims. (Cl. 99-176). Paper having a continuous moistureproofing lining of rubber hydrochloride and regenerated cellulose throughout the fibers and interstices of the paper.

2,201,734. Pulpstone. Carl L. Leafe, assignor to Norton Company, Worcester, Mass. Filed June 9, 1938. 4 claims. (Cl. 51-206). A reinforced Portland cement concrete center portion and an outer portion integrally joined thereto and comprising Portland cement concrete embedding and bonding abrasive aggregates.

2,201,797. Process of producing molding composition from lignin and formaldehyde. Clarence W. Scott, Moss Point, Miss. Filed Oct. 22, 1937. 3 claims. (Cl. 260-67). Waste combustion gases are passed through black liquor to precipitate the lignin, which is washed with acidulated water, dissolved in ammonium hydroxide and reacted with formaldehyde.

2,201,812. Process of concentrating and dialyzing waste pulp liquor and the product thereof. Friedrick Konrad Daniel, Kew Gardens, N. Y. Filed July 17, 1939. 24 claims. (Cl. 260-124). A vacuum-concentrated liquor from which a substantial portion of the low molecular weight substances is removed.

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2,202,032. Apparatus for vibrating paper making machines. Edward W. Smith, assignor to Submarine Signal Company, Boston, Mass. Filed May 20, 1938. 10 claims. (Cl. 92-45). A shake section for a Fourdrinier machine.

2,202,064. Molded article. John H. Olsen, assignor to Pulp Reproduction Company, Milwaukee, Wis. Filed May 31, 1938. 1 claim. (Cl. 240-13). A receptacle formed of paper pulp.

2,202,159. Waxing machine. Nicholas Marcalus, Elizabeth, N. J. Filed March 17, 1937. 1 claim. (Cl. 91-55). A wax coating machine in which the material is passed through the tank and around a chilled drum.

2,202,213. Method of packaging. Arthur W. Lindholm, assignor to Pneumatic Scale Corporation, Limited, Quincy, Mass. Filed May 13, 1938. 3 claims. (Cl. 93-6).

2,202,247. Adhesive. Paul B. Davidson and Julius R. Adams, assignors to Old Colony Envelope Company, Westfield, Mass. Filed Nov. 20, 1936. 2 claims. (Cl. 134-23.4). Partially dextrinized starch and dioxane in water.

2,202,331. Treatment of textiles. Ernest Butterworth, assignor to Imperial Chemical Industries, Limited. Filed June 21, 1938. 2 claims. (Cl. 8-109). A two-stage bleaching method for bleaching linen and other long bast fibers.

2,202,332. Bleaching of textiles. Ernest Butterworth, assignor to Imperial Chemical Industries, Limited. Filed Aug. 4, 1937. 5 claims. (Cl. 8-108). A two-stage bleaching process with hypochlorite of two different strengths.

2,202,333. Method of bleaching linen and like bast fiber material. Ernest Butterworth and Bertram Pusey Ridge, assignors to Imperial Chemical Industries, Limited. Filed Jan. 4, 1938. 9 claims. (Cl. 8-109). A two-stage bleaching process using hypochlorite and hydrogen peroxide.

2,202,334. Treatment of textiles. Ernest Butterworth and Bertram Pusey Ridge, assignors to Imperial Chemical Industries, Limited. Filed June 10, 1938. 5 claims. (Cl. 8-109). In the hypochlorite bleaching of bast fibers with hypochlorite, a pretreatment with an alkaline sulphite at 60 to 100 deg. C.

2,202,335. Treatment of textiles. Ernest Butterworth and Joseph Arthur Musgrave, assignors to Imperial Chemical Industries, Limited. Filed July 26, 1938. 5 claims. (Cl. 8-109). A two stage bleaching process, using substantially neutral hypochlorite and then alkaline hydrogen peroxide.

2,202,431. Manufacture of paper bags. Karl Rohrbacker, Berlin, Germany. Filed July 13, 1937. 14 claims. (Cl. 93-28). Paper bags with block bottoms.

2,202,478. Bleaching of cotton. Thomas E. Bell, assignor to E. I. du Pont de Nemours & Company, Wilmington, Del. Filed Dec. 1, 1938. 1 claim. (Cl. 8-111). Hydrogen peroxide containing sodium silicate is used.

2,202,496. Machine for adhesively applying and securing covering material to articles. Leon E. LaBombard, assignor to The International Paper Box Machine Company, Nashua, N. H. Filed March 17, 1939. 62 claims. (Cl. 93-36).

2,202,558. Paper oil container. Martin P. Kernahan, assignor to The Canister Company, Phillipsburg, N. J. Filed Nov. 25, 1938. 14 claims. (Cl. 229-3.5). The base is a parchmentized or greaseproof paper with a backing of chipstock and a protective coating including one or more windings of moistureproof paper.

2,202,678. Low viscosity starch adhesive and method of preparing the same. Kyle Ward, Jr., dedicated to the free use of the people. Filed June 13, 1938. 6 claims. (Cl. 134-23.4). Starch is subjected to the action of an aqueous solution of an organic onium hydroxide.

2,202,717. Process of making paper. Donald K. Pattilloch, assignor to Pattilloch Processes, Inc., Boston, Mass. Filed March 20, 1936. 3 claims. (Cl. 92-21). A method of flowing the fiber-water mixture over electrically charged anode and cathode electrodes and maintaining the mixture in the electrified zone long enough to attract the negatively charged colloids to the anode and to discharge them as positively charged gel.

2,202,737. Apparatus for use in the manufacture of paper. Karl Dammann, Trenton, N. J. Filed Feb. 15, 1938. 10 claims. (Cl. 103-26). A pumping system for supplying a uniform demand of pulp.

2,202,765. Bonding adhesive for an abrasive article such as sandpaper. Durward Ogden Guth, assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn. Filed Sept. 11, 1930. 20 claims. (Cl. 260-29). A resinified condensation product of a polyhydric compound and an aromatic acid and a flexibilizing and gelatinizing compound.

2,202,790. Waste paper stock pump. Frank R. Forrest, assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis. Filed Feb. 23, 1938. 12 claims. (Cl. 103-115). A rotary pump.

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2,202,839. Cigarette mouthpiece. Glenn Davidson, Aurora, Ill. Filed May 4, 1936. 6 claims. (Cl. 93-1). Method of manufacture from paper.

2,202,870. Creped article including metal foil. William Wallace Rowe, assignor to The Paper Service Company, Lockland, Ohio. Filed Aug. 5, 1935. 1 claim. (Cl. 154-55). A layer of backing substance and a plurality of sidewise-disposed layers of metal foil, the whole being creped and embossed.

2,202,890. Pressure and vacuum forming papermaking machine. Earl E. Berry, assignor to Beloit Iron Works, Beloit, Wis. Filed March 27, 1936. 32 claims. (Cl. 92-44). A stock inlet, etc.

2,203,006. Paper tube and method of making. Leonard A. Young, Detroit, Mich. Filed July 23, 1938. 9 claims. (Cl. 93-94).

2,203,173. Felted fabric sheet. William J. Moeller, assignor to The Philip Carey Manufacturing Company, Lockland, Ohio. Filed Sept. 6, 1935. 2 claims. (Cl. 92-3). A waterlaid web of felt composed of about 75 per cent newspaper, 10 per cent flock from woolen fabrics and 15 per cent of alpha-cellulose.

2,203,181. Web handling apparatus. Adolph Potdevin and Robert L. Richmond, assignors to Potuevin Machine Company, Brooklyn, N. Y.

Filed July 1, 1938. 12 claims. (Cl. 242-76). A photoelectric web controlling device.

2,203,205. Method of bleaching pulp. Francis G. Rawling, assignor to West Virginia Pulp & Paper Company, New York, N. Y. Filed Oct. 8, 1937. 1 claim. (Cl. 8-105). A method of after-bleach, in which the partially bleached pulp is subjected to alternate treatments with chlorine and alkaline hypochlorite without washing between the treatments.

2,203,212. Bleaching pulp. Ferri Casciani, assignor to Niagara Alkali Company, Niagara Falls, N. Y. Filed Feb. 14, 1939. 5 claims. (Cl. 8-105). A multistage process using chlorine and hypochlorite.

2,203,231. Treatment of cellulosic materials such as paper and fabrics to make them resistant to water. Thomas Lloyd Osborne, assignor to Callender's Cable and Construction Company, Limited, London, England. Filed May 11, 1938. 8 claims. (Cl. 8-120). The process consists in forming on the fibers a film of cellulose rosinate by subjecting it to heat and a vacuum while the fibers are in intimate contact with rosin.

2,203,232. Means for protecting sheaths of electrical cables, pipes, and other metal articles against corrosion. Thomas Lloyd Osborne and Harold John Allcock, assignors to Calender's Cable and Construction Company, Limited, London, England. Filed May 11, 1938. 4 claims. (Cl. 91-68). The material is wrapped with a paper, the fibers of which are coated with cellulose rosinate and the passages between the coated fibers are sealed by a water-excluding compound.

2,203,343. Apparatus for producing molded pulp articles. Carl Stack, Gary, Ind. Filed July 24, 1937. 2 claims. (Cl. 92-59).

2,203,510. Method and machines for making paper cups. Harold J. Smith and Carl B. Bild, assignors to Dixie-Vortex Company, Chicago, Ill. Filed Dec. 13, 1934. 24 claims. (Cl. 93-36.2).

2,203,513. Apparatus for and method of making containers. Walter E. Amberg, assignor to Dixie-Vortex Company, Chicago, Ill. Filed Jan. 15, 1936. 41 claims. (Cl. 93-36.2).

2,203,515. Container making machine. Cesare Barbieri, assignor to Dixie-Vortex Company, Chicago, Ill. Filed Oct. 5, 1936. 13 claims. (Cl. 93-36.2). Conical cup making machine.

2,203,547. Power actuated gauge for paper cutting machines and the like. William M. Reichart, assignor to The Chandler and Price Company, Cleveland, Ohio. Filed Aug. 18, 1939. 10 claims. (Cl. 164-59).

2,203,607. Web splicing device. Henry A. Wise Wood, assignor to The Wood Newspaper Machinery Corporation, New York, N. Y. Filed March 11, 1936. 15 claims. (Cl. 242-58).

2,203,633. Waxed wrapping paper. Cecil M. Rhodes, assignor to Rapinwax Paper Company, Minneapolis, Minn. Filed July 15, 1935. 2 claims. (Cl. 91-68). A base sheet, a coating of latex rubber, a second coating of wax, the two layers commingling only when the wax is softened.

June 11, 1940

2,203,802. Device for bringing the stock stream upon the screen of a paper making machine. Wilhelm Thaler, assignor to American Voith Contact Co., Inc., New York, N. Y. Filed March 10, 1938. 1 claim. (Cl. 92-44). A nozzle device for a stock receiving container.

2,203,900. Apparatus for sealing cartons. Harry S. Fox and Kenneth W. Emerson, assignors to Hawaiian Pineapple Company, Limited, Honolulu, Territory of Hawaii. Filed Aug. 1, 1939. 26 claims. (Cl. 93-6).

2,203,901. Apparatus for sealing cartons. Francis N. Todd and Kenneth W. Emerson, assignors to Hawaiian Pineapple Company, Limited, Honolulu, Territory of Hawaii. Filed Aug. 1, 1939. 20 claims. (Cl. 93-6).

2,203,925. Stock regulating apparatus for paper machines. Ernest Poirier, Waterville, Maine. Filed May 12, 1937. 4 claims. (Cl. 137-78). A gate for controlling the flow of stock, means for delivering diluting water to the mixing compartment, etc.

2,204,066. Preservation of fibrous cellulosic material. Ernest R. Boller, assignor to E. I. du Pont de Nemours & Company, Wilmington, Del. Filed June 22, 1937. 2 claims. (Cl. 92-21). Zinc chloride and sodium dichromate in an amount equivalent to at least about 0.8 per cent on the basis of the dry weight of the pulp are heated to about 150 deg. F. for a time sufficient to cause a substantial portion of the zinc and chromium to be fixed on the fibers and a felted product is formed therefrom.

2,204,067. Cutting machine. Hobart W. Bruker, assignor to George W. Swift, Jr., Inc., Bordentown, N. J. Filed Dec. 21, 1938. 10 claims. (Cl. 164-68).

2,204,141. Ornamental paper manufacture. Frederick V. Lofgren, assignor to Glenn Davidson, Aurora, Ill. Filed Dec. 24, 1936. 11 claims. (Cl. 41-17). A washable wallpaper.

2,204,227. Paper cutter. Clarence H. Richardson, Peoria, Ill. Filed Jan. 26, 1939. 2 claims. (Cl. 164-89.5).

2,204,274. Wax paper folding machine. Frank M. Hitner, Detroit, Mich. Filed March 28, 1938. 11 claims. (Cl. 93-84). A machine for continuously unrolling a flat wide ribbon of waxed paper and folding and creasing it into a narrow ribbon.

2,204,276. Method and apparatus for forming pulp articles. William P. Lass, Santa Cruz, Calif. Filed July 27, 1936. 10 claims. (Cl. 92-57).

2,204,426. Papermaking machine. William Hulse Millspaugh, assignor to Sandusky Foundry and Machine Co., Sandusky, Ohio. Filed June 19, 1936. 2 claims. (Cl. 92-49). A combination of suction rolls, suction boxes, etc.

June 18, 1940

R21,485. Composition of matter containing a cellulose derivative. Harry M. Weber, assignor to Ellis-Foster Company, Montclair, N. J. Original No. 1,690,515, dated Nov. 6, 1928. Application for reissue Sept. 14, 1939. 5 claims. (Cl. 260-16).

2,204,600. Method and means for coating paper. Fred Kabela and George F. Whiting, assignors to Lowe Paper Company, Ridgefield, N. J. Filed April 6, 1938. 10 claims. (Cl. 91-55).

2,204,612. Sized paper. Sidney Musher, assignor to Musher Foundation, Incorporated, New York, N. Y. Filed June 10, 1936. 5 claims. (Cl. 91-68). The sizing agent is 90 per cent of paraffin and 10 per cent of cacao butter.

2,204,615. Process of making soluble starch. Walter A. Nivling, Newton, Mass. Filed Aug. 26, 1937. 2 claims. (Cl. 127-33). A method of oxidizing starch.

2,204,780. Suction roll for papermaking machines. Wilhelm Thaler, assignor to American Voith Contact Co., Inc., New York, N. Y. Filed Nov. 4, 1937. 1 claim. (Cl. 92-53).

2,204,801. Method and apparatus for drying coated and decorated webs. Albert E. Gessler, assignor to Interchemical Corporation, New York, N. Y. Filed June 30, 1937. 6 claims. (Cl. 34-48). Method for removing solvent which is substantially nonvolatile at room temperature by the use of a heated oven.

2,204,802. Means for controlling web temperatures in printing. Albert E. Gessler, assignor to Interchemical Corporation, New York, N. Y. Filed June 30, 1937. 8 claims. (Cl. 34-24).

2,205,005. Machine for forming the bottoms of bags. Edward E. Anderson, Loma Linda, Calif. Filed May 20, 1939. 4 claims. (Cl. 93-26).

2,205,199. Sedimentation. George E. Hubbell, Charles H. Scott, and George M. Darby, said Scott and Darby assignors to The Dorr Company, Inc., New York, N. Y. Filed Aug. 20, 1937. 10 claims. (Cl. 210-55).

2,205,201. Machine for making wall strips. Joseph Iwaniw, New York, N. Y. Filed Oct. 5, 1939. 12 claims. (Cl. 91-16).

2,205,296. Pulpstone. Carl L. Leafe, assignor to Norton Company, Worcester, Mass. Filed March 2, 1939. 1 claim. (Cl. 51-207). an artificial pulpstone.

2,205,374. Digesting process and apparatus. Thomas L. Dunbar, assignor to Chemipulp Process, Inc., Watertown, N. Y. Filed July 2, 1936. 10 claims. (Cl. 92-7). Waste acid liquor from the lower portion of a digester is led to a degassing tank at the end of the cook, the gases separated from the liquor and absorbed in raw acid liquor and then heated by heat exchange with the first-mentioned liquor.

June 25, 1940

2,205,428. Moistureproofing. James A. Mitchell, assignor to E. I. du Pont de Nemours & Company, Wilmington, Del. Filed July 15, 1937. 18 claims. (Cl. 91-68). A wax and a sulphurized organic material, such as unsaturated oils, acids, natural or synthetic resins.

2,205,529. Dry-sealing envelope. Vincent E. Heywood, assignor to United States Envelope Company, Springfield, Mass. Filed May 23, 1938. 4 claims. (Cl. 229-80).

2,205,557. Waterproof and greaseproof paper. Harry C. Fischer, James F. Thompson, and Walter E. Sooy, assignors to The Gardner-Richardson Company, Middletown, Ohio. Filed Oct. 7, 1937. 7 claims. (Cl. 91-68). Soybean proteins hardened with formaldehyde and a coating of cellulose acetate.

2,205,693. Paper-making machine. Samuel Milne, Edinburgh, Scotland. Filed March 22, 1937. 6 claims. (Cl. 92-44). A unitary breast box construction for a papermaking machine.

2,205,704. Process for producing free cellulose fiber. George M. von Hassel, Berlin, Germany. Impure cellulosic fibers are mixed with water-insoluble material and water to form a mud, the mud is dried and blowed through a series of sieves, the fibers being retained on the sieves.

2,205,718. Machine for making paper bags. Arno Finke, Lengerich, Westphalia, Germany. Filed July 27, 1938. 6 claims. (Cl. 93-18).

Color Popularity in Ink Sales Analysis

The most popular printed color is not a color at all —it is black, according to an analysis of printing ink sales to commercial printers made by the International Printing Ink Division of Interchemical Corporation.

The figures on which this analysis is based over a two year period and represent the sales of IPI Everyday inks. The Everyday line is used largely for commercial printing on automatic presses so that the survey would include little magazine or package printing.

Disregarding black, red is the most widely used color. Blue is a close runner-up for red's top place in color popularity with a slight difference between the sales of red and blue.

There is a sharp drop in popularity between these two leaders and green, the next most frequently used color. Although there has been a steadily increasing demand for green in recent years, the sales of green still amount to less than half of those for either red or blue. Apparently these two primary colors are still firmly entrenched in the public favor.

The demand for yellow and brown is about the same, but it lags far behind that for green. Orange closely follows these colors. Purple and gray are the least popular colors, totalling between them less than 5 per cent of the sales recorded for red and blue.

It is evident that in such an analysis as this, the figures available for certain colors should be weighted. The figures for the sale of yellow, for example, should be tempered by the realization that yellow is used to a greater extent for mixing with other colors than for straight applications. Therefore, the place of yellow in the popularity scale should doubtless be shifted downward.

The same interpretation of the figures is necessary in the case of white, which, if included, would stand slightly higher than green in the popularity rating. However, it is apparent that the primary use of white is to extend other colors and consequently, the inclusion of white as the third most popular color would distort the picture.

To summarize, black still outsells any color by a considerable margin. Among the colors the order of popularity is red, blue, green, yellow, brown, orange.

Dowtherm Heating Systems*

By Pell W. Foster, Jr.[1]

Abstract

Dowtherm is a eutectic mixture of organic compounds, diphenyl and diphenyloxide. Dowtherm "A" which is the mixture that has been used particularly for high temperature processes, is made up of 26.5 diphenyl and 73.5 per cent diphenyloxide. The characteristic which fits it particularly for use in high temperature heating problems is its high boiling point, as shown by the fact that under atmospheric pressure it has a boiling point of 500 deg. F. and boils at 700 deg. F. at 88 lb. gage. Operation of this indirect heating system is as simple as running an ordinary low pressure steam boiler. The liquid is put into a water tube-type boiler of similar design to that of a steam boiler. Heating of the boiler generates Dowtherm vapor. The vapor leaves the outlet connection of the boiler and flows to heating coils or jackets in the vessel containing the material to be heated. In giving up this heat in the jackets or coils, the vapor is condensed and the condensate is returned to the boiler for re-evaporation.

Dowtherm is an eutectic mixture of the organic compounds diphenyl and diphenyloxide. Dowtherm "A" is the mixture that has been used particularly for high temperature processes and is made up of 26.5 per cent diphenyl and 73.5 per cent diphenyloxide. The characteristic which fits it particularly for use in high temperature heating problems is its high boiling point, as shown by the fact that under atmospheric pressure it has a boiling point of 500 deg. F. and boils at 700 deg. F. at 88 lb. gage. A comparison of the temperature and pressure characteristics of steam and Dowtherm vapor is shown in Fig. 1. It will be noted that saturated Dowtherm vapor at a temperature of 500 deg. F. has an absolute pressure of 15 lb., while saturated steam at the same temperature has an absolute pressure of 679 lb. At a temperature of 700 deg. F. saturated steam has a pressure of 3100 lb. per sq. in., whereas Dowtherm vapor has a vapor pressure of only 103 lb. per sq. in. absolute.

Operation of a Dowtherm indirect heating system is as simple as running an ordinary low pressure steam boiler. Dowtherm liquid is put into a water tube boiler of similar design to that of a steam boiler. Heating of the boiler generates vapor. The vapor leaves the outlet connection of the boiler and flows to heating coils or jackets in the vessel containing the material to be heated. In giving up this heat in the jackets or coils the vapor is condensed and the condensate is returned to the boiler for re-evaporation.

Although an inflammable material, Dowtherm "A" cannot be considered particularly hazardous, as the possibility of explosion of either the liquid or the vapor is negligible. The liquid has a flash point of about 215 deg. F. but cannot support its own combustion at this temperature. The decomposition of chemical is practically negligible up to 700 deg. F. From 700 deg. F. to 750 deg. F. measurable decomposition does occur and constant operation at these temperatures would require periodic repurification of the used material and the addition of a small percentage of new fluid.

The boiler or vaporizer must be built for the specific service involved and to meet the requirements of a fluid differing so widely from water. A typical unit is shown in Fig. 2. It may be arranged for either gas or oil firing. The design includes a furnace having walls protected by tubes in which Dowtherm is heated, thus providing the principle of protection to furnace refractories that is effected by water walls in boiler furnaces. The installation of baffles, which cause the gases to make several passes through the tube bank, insures an efficient unit in spite of the high boiling point of Dowtherm. By designing the boiler to operate at a normal rating, efficiencies on the order of 70 per cent are obtained. The tubes are expanded into serrated seats in the drums as an extra precaution against leakage. The smaller sizes are provided with steel castings lined with refractory tile and insulation to give efficient permanent settings.

Vapor Generator

DOW CHEMICAL CO. PLANT

The vapor generators should be designed to provide positive and rapid circulation in order to avoid tube wall temperatures greatly in excess of the temperature of the vapor generated. It is also imperative that the boiler shall contain sufficient storage capacity

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Roosevelt Hotel, New York, N. Y., Feb. 19-22, 1940.

[1] Member TAPPI, Foster-Wheeler Corp., New York, N. Y.

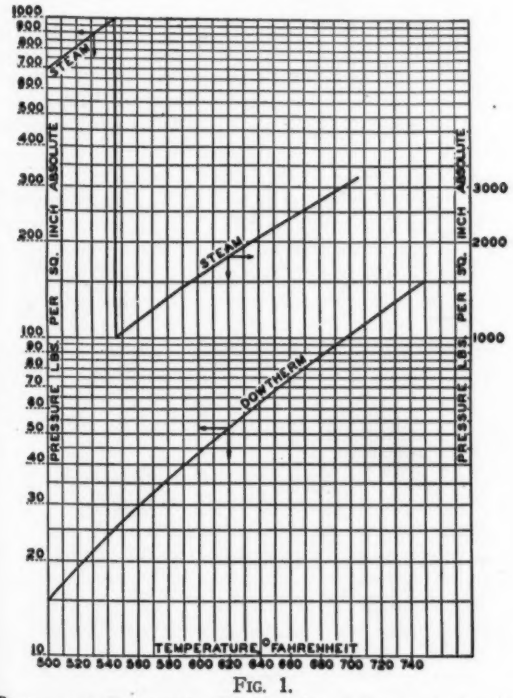

FIG. 1.
Pressure and Temperature Characteristics of Steam and Dowtherm Vapor.

for the liquid to maintain the proper height, when the dense vapors have filled the entire process system. This supply of liquid should be out of contact with the heating surfaces but should always be available for circulation within the tubes. To fulfill both of these conditions, the first vapor generator was designed for forced circulation with the vapor and liquid storage drum placed below the heating surface as shown in Fig. 3. Liquid from the drum is forced through the heating elements, passing through radiant tubes, then through convection tubes, and back to the drum, where vapor becomes disengaged from the liquid.

In this system, installed in the Dow Chemical Company's plant at Midland, Mich., vapors pass through a vapor header serving several stills and process units; the condensate is collected and flows by gravity from the units back to the drum. When this unit was designed, it was felt advisable to have the drum below the boiler so that the boiler could be instantly drained into the drum in the event of tube failure. In 7 years of service it has never been necessary to make use of this feature, and vapor generators are now built somewhat along the lines of water tube steam boilers. All installations, however, are provided with rundown tanks large enough to hold the entire supply of Dowtherm in the system.

This first system was installed in the Dow plant in 1932 and was used intermittently for 3 years, operating 30 hours continuously every 2 weeks. Since 1935 it has been in service 24 hours daily, 5 days a week. Normal operating pressure is 15 lb. per sq. in. in the generator giving a temperature of 560 deg. F. at the three vacuum stills it serves. On occasion the pressure is carried to 45 lb. per sq. in. to give a temperature of 630 deg. F. at the stills. Normal heat output of the vapor generator has been 1,000,000 B.t.u. per hr. for the last 4 years, but it has run as high as 2,000,000 B.t.u. The generator is designed for a maximum of 4,500,000 B.t.u. per hr. to take care of future plant requirements.

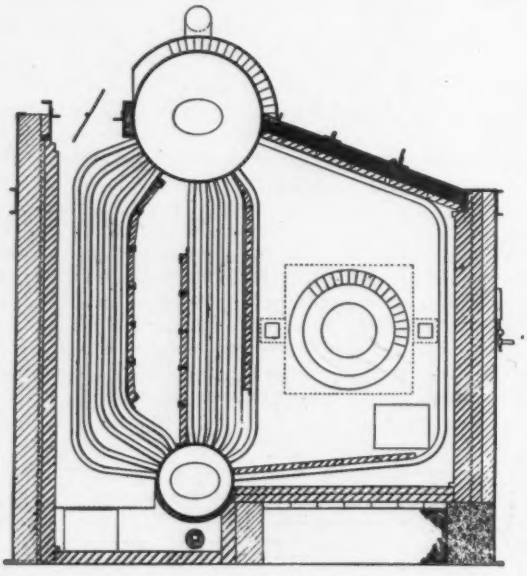

FIG. 2.
Dowtherm Vapor Generator.

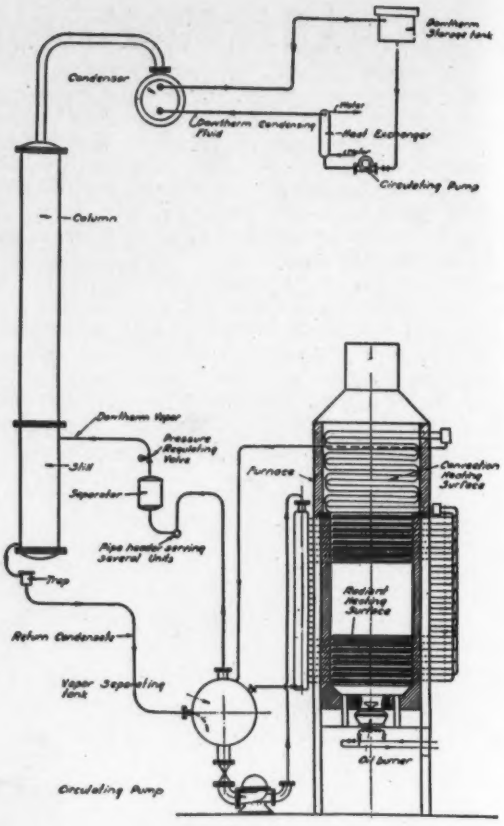

FIG. 3.
Diagram of Forced Circulation Vapor Generator and One of the Three Vacuum Stills Which It Serves at the Midland Plant of the Dow Chemical Company.

BAKELITE CORP. PLANT

The second vapor installation was made for the Bakelite Corp. at Bound Brook, N. J. The vapor generator consisted of two horizontal drums connected by symmetrical banks of vertical tubes with the furnace placed between the banks, the flow of flue gases being horizontal through the furnace and back through the tube banks in parallel. This pioneering unit has depended upon natural circulation; this provides unobstructed natural flow of liquid in the boiler. The vapor generator at the Bakelite plant is used in connection with a batch system of resin heating in jacketed kettles. The system was equipped with a steam-jet vacuum pump to permit operation at temperatures below 500 deg. F. which is desirable in the first and last stages of the heating; Dowtherm is also used in a heater to superheat steam for processing within the kettles.

Oil or gas is customarily used as fuel and is governed by semiautomatic control. A high-low burner regulated by a thermostat or pressure element in the vapor line maintains a constant temperature of the vapor by operating on high or low flame. An overpressure control, set to function at some pressure in excess of the usual operating pressure, protects the system by shutting off the fuel supply if the thermostatic or pressure control for the burner fails to act. A safety valve safeguards the apparatus in case all of the other control devices fail.

Design of Systems

The simplest form of indirect system, as shown in Fig. 4 is where the heat user is located at sufficient elevation above the boiler so that the condensate will return from the user to the boiler by gravity. The temperature of the product heated in the user may be controlled either by throttling the fuel supply to the burner serving the boiler, or the actual supply of vapor to the user may be throttled, the opening and closing of the throttling valve being thermostatically controlled by the temperature of the product being heated. It is obvious that, where the gravity condensate return system is utilized, the difference in elevation between the user and the boiler must be sufficient, so that the friction loss will be less than the available static head between the bottom of the user and the liquid level in the upper drum of the boiler.

Where it is not possible to put the user sufficiently above the boiler to return condensate to the boiler by gravity, a return pump must be used, as shown in Fig. 5. With this setup the condensate from the user is collected in a hotwell below the user. The return pump takes suction from the hotwell and returns the condensate to the boiler. On account of the high temperature of the condensate the return pump must be of the centrifugal type and must be designed for high temperature service with a water jacketed stuffing box. As Dowtherm is a fairly expensive material provision must be made so that the liquid leaking from the stuffing box is piped to the cold storage tank so as to return the liquid to the system.

In cases where there are several users, where available space does not allow the use of a gravity return system, an arrangement similar to that shown in Fig. 6 may be used. With this arrangement condensate from the various users is collected in a condensate receiver, from which it is pumped back to the boiler. The proper quantity of liquid is maintained in the boiler in spite of fluctuations in the heat demand of the system by the use of a liquid level control as shown. It will be noted that there is a throttling valve, as shown, on the vapor line to each of the users. These valves may be actuated thermostatically so as to maintain the desired temperature in the product. It is apparent that decreasing the supply of Dowtherm to any one user through throttling will give a lower pressure in its coil than will be the case in the coils of users which are not throttled. This may result in a pressure differential which will push liquid from the condensate receiver tank up into the coils of the throttled units. It is necessary, therefore, in designing the condensate receiver tank to provide sufficient volume so that this flooding may occur and still maintain a liquid seal at all times for the suction

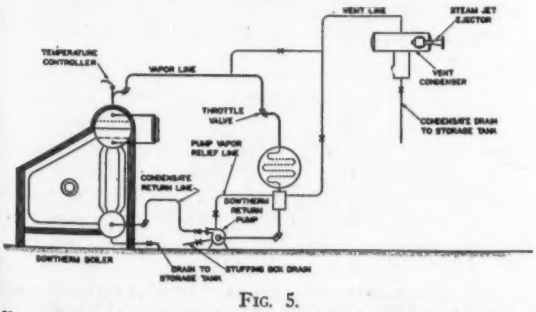

FIG. 5.
Vapor Heating System Showing Method of Applying Steam Jet Ejector.

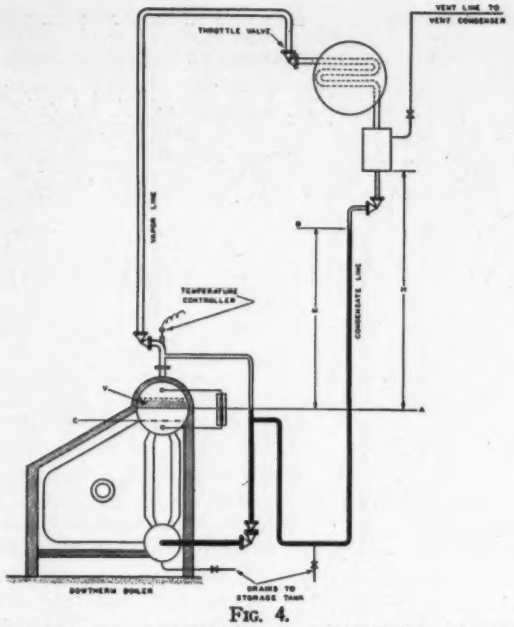

FIG. 4.
Simple Arrangement of Vapor Generator, Showing Method of Installing Hartford Loop. Distance *M* Represents the Head of the Friction Loss in the Vapor Line, Heater, and Condensate Line.

line to the return pump so that the normal level in the boiler may be maintained.

The Use of Dowtherm for Cooling

On account of its high boiling point, and also because it is not scale forming, Dowtherm is an ideal medium for cooling as well as heating. As an example, let us consider a case where we have the contents of a batch still which must be cooled from 700 to 600 deg. F. To effect this cooling liquid Dowtherm could be pumped through coils located in the still, then heated to 550 deg., and evaporated. In order to cool it and at the same time transfer the heat extracted into a more useful form, the vapor could pass to a condenser, where in condensing it would generate steam at 150 lb. gage pressure, corresponding to a temperature of 366 deg. F., or it could be used to generate steam at 400 lb. gage pressure, corresponding to a temperature of 444 deg. F. It is to be noted that the cooling system would be

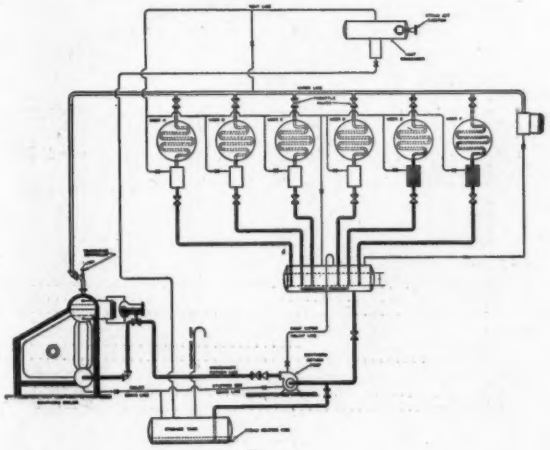

FIG. 6.

under a maximum pressure of 12 lb. per sq. in. gage.

Possible Applications in Paper Mills

Dowtherm has been considered in the paper industry as a method for obtaining higher temperature air than could be obtained from the existing boiler plant, either to use on driers or for any other purposes in a given paper mill. Paper mill engineers have also considered the use of Dowtherm as the heating medium in the rolls of driers. Here again it would give high temperature without requiring high pressure construction in the rolls. Other uses in paper mills will develop after the engineers of the industry have become more familiar with the peculiar advantages of this chemical for the purposes of both high temperature heating and cooling.

New Interpretations of Structural Aspects of the Paper Sheet*

By G. E. Landt[1] and S. A. Rulon[2]

Abstract

The possibilities of explaining the properties of paper in terms of fundamental cellulose molecular structures as they are understood today are given.

The conventional approach to the characteristics of the paper sheet is through the evaluation of its physical properties by the conventional tests for bursting, tensile, and tearing strengths, density, curl, moisture-resistance, and other empirical tests.

There have been extensive attempts to interpret such data, particularly with reference to the beating cycle. Such interpretations can generally be classified under one of two headings: either as consequences of fibrillation *(1)* or as consequences of hydration *(2)* of the cellulose fiber. In each case there seems to have been little attempt to analyze the descriptive terms for the fundamental mechanisms, which they must represent.

It was in 1912 that Friedrich and Knipping discovered that crystals scattered a beam of x-rays. The Braggs quickly formulated the principles of determining molecular structures by reading the patterns of such scattered or diffracted beams. In 1917 DeBye and Scherrer *(3)* applied these principles to a study of ramie fibers, and from the appearance of well defined diffraction patterns they postulated the cellulose as a crystalline substance. Herzog and Jancke *(4)* confirmed this in 1920.

In the course of time, Sponsler and Doree *(5)* postulated a cellulose molecule made up of chains of cellobiose units, each unit representing a primary cell in the chain. The dimensions for this cell were established by Polanyi *(6)* and its architecture elaborated by Meyer and Mark *(7)*, Fig. 1.

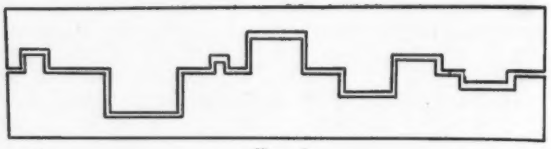

FIG. 1.
Conjugated Surfaces.

Such unit cells are organized in chains parallel to the fiber axis and are spirally disposed thereto. From certain characteristics of the interference patterns, Herzog and Hengstenberg *(8)* concluded that these crystallites are secondary structures of 56 Å diam. and 500 - 600 Å length. These are the micelles which Von Nageli postulated in 1877, which we will more correctly term as crystallites in the ensuing discussion.

These crystallites are further aggregated to form fibrils *(9)* which have recently been represented by Bailey and Brown *(10)* as elementary structures of constant and uniform size. Bundles of fibrils make up the cellulose fiber, which we fashion into a sheet of paper.

Table I gives the dimensions of this fundamental cellulose architecture.

In this representation of the cellulose fiber, we wish to focus our conjectures on four of its fundamental characteristics:

(a) The force binding the atoms or atomic groups into chains are predominantly primary valence forces;

(b) The forces which associate the molecular chains into crystallites are primarily forces of molecular cohesion, sometimes termed Van der Waals forces, likewise designated as residual valences. These probably also predominate in the assembly of crystallites into fibrils.

(c) The crystallites and the chain molecules of

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[2] Continental-Diamond Fibre Co., Newark, Del.

TABLE I

		A	MM	Relative size
Unit cell				
Length		10.0	.00000103	1.3
Width		8.6	.00000086	1.1
Depth		7.8	.00000078	1.0
Micelle				
Length		500	.0000500	64
Diameter		56	.0000056	7.2
Fibril				
Length	Uncertain			
Diameter	0.9-1.0 micron	9,000-10,000	.0009-.001	1200
Fiber (cotton)				
Length	1-5 cm.	100,000,000-500,000,000	10-50	12,800,000-64,000,000
Diameter	0.012-0.042 cm.	1,200,000-4,200,000	.12-.42	154,000-540,000

which they are composed have surfaces that are studded with OH groups.

(d) The OH group is undoubtedly the center of molecular cohesive forces as the mol cohesion in calories per molecule is 7250 cal. *(11)*, the largest value of any radical usually associated with organic compounds excepting the COOH and the ester groups neither of which occur here. The CH_3 and CH_2 groups have values of 1780 calories per mol, and all other linkages in the cellulose structures are less than this.

Fundamentals of Paper Structure

With these four characteristics before us, we wish to explore certain fundamentals of paper structure.

We will postulate that all the physical characteristics of a sheet of paper must be related to:

(A) the primary valence linkages in the cellulose chain molecule; (B) the forces of molecular cohesion between chains; and (C) conjugated surfaces.

Conjugated surfaces are shown schematically in Fig. 2.

Two such interlocked surfaces cannot move or slide past each other unless energy is expended in (a) shearing off protuberances, (b) bending them in elastic deformation, (c) compressing them, (d) or causing them to flow out of their interlocked position.

When a sheet of paper is ruptured in any physical test, then the felted fibers must be twisted or compressed to destroy the conjugated surfaces; the fibers must break into shorter sections, and they must shear along their major axes in rupturing the sheet.

Since the cellulose fiber is highly elastic and readily compressible, the forces (C) required to displace conjugated surfaces are readily overcome. If, therefore, the paper sheet has strength, the forces due to (A) and (B) must predominate in the product.

When a stress such as tensile stress is applied to a sheet of paper, the fibers will first slip, where the conjugations are disrupted; it will then shear along the lines of cohesion parallel to the fiber and finally break at the atomic linkages across the fiber. This is of course a simplified picture of the mechanism of rupture. Actually these actions may occur simultaneously.

The viscosity of a cellulose solution in cuprammonium hydroxide has been accepted as being indicative of the molecular dimensions *(12)*. It may be accepted that larger molecules are also longer molecules. In the longer units the proportionate "end cohesions" are less. Therefore, higher tensile strengths in the fibers should be expected. This has been verified in cotton threads. In Table II we have shown the effect of viscosity or molecular chain length on the strength characteristics of a cotton rag paper.

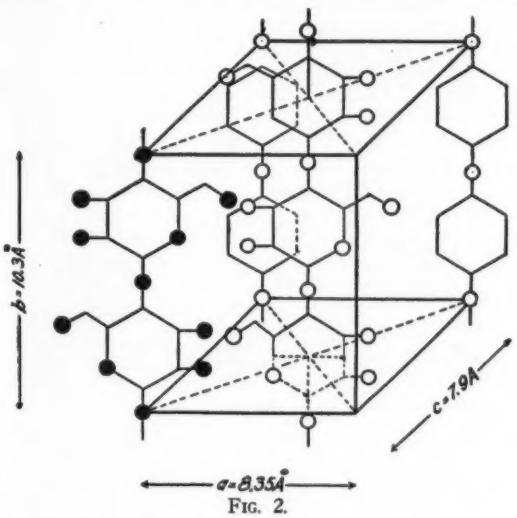

FIG. 2.

TABLE II

Sheet	Viscosity [1] sec.	Freeness [2]	Sheet Characteristics: Wt., sheet, g.	Thickness	Tensile, lb., ave.	Tear, ave.
A	626	695	8.4	.010	8.5	114
B	129	715	11.0	.017	4.0	141

A and B were made from cotton pulps of high and low viscosities, respectively, and cooked in 3% caustic prior to beating. They were beaten in a standard beater to approximately the same freeness and the same fiber length as determined by microscopic inspection. Handsheets were made from them.

[1] In sec. TAPPI Standard T 206 m-37

[2] By the Williams freeness tester

Table II shows that the tensile strength is in fact higher for the greater viscosity. On the other hand, the tear shows the opposite tendency. The tear characteristics of paper will be discussed further in a subsequent section of the paper, but in the above table the increase is just about proportional to the increased weight of the heavier sheet.

Effect of Protracted Beating

The increase in shrinkage and in tensile strength with protracted beating has been pointed out by many investigators. It is again presented for a rag pulp of high viscosity (new rags) in Table III.

TABLE III

Sheet	Beating time, min.	Freeness	Sheet properties: Thickness, in.	Wt., g.	Area, cm^2	Density	Tensile, ave.	Tear, ave.
C	30	695	.010	8.4	870 cm^2	.38	8.50	114
D	90	205	.0085	8.8	784 cm^2	.52	21.56	128
E	180	130	.0075	9.0	676 cm^2	.70	29.12	137

Cotton pulp cooked for 8 hr. in 3% caustic and beaten at the designated time intervals. Handsheets of uniform weight were then molded and dried.

The data in Table III require an adequate explanation for the 22 per cent diminution in area and the 42 per cent decrease in volume of the sheet (from sheet C to sheet E), likewise the 84 per cent increase in density, and the rapid increase in tensile strength (244 per cent, sheet C to E) during the process of beating.

We must assume that powerful forces have been developed to contract the sheet and to account for the additional stress required to rupture the sheet.

An explanation of this based on increased fibrillation cannot account for the increased strength even if the diminished volume is explained by closer packing of the fibers excepting in the case of the tear values. It is of interest that the tear[3] increase (20 per cent) approximates closely the decrease in thickness (25 per cent). We may conclude that the number of structural linkages torn per unit of time (for the tear test involves a time factor) has increased in proportion to the packing effect.

The structural linkages are broken as a unit in the case of samples tested in tension. Theoretically, the time factor of breaking a sample in tension is zero. It is to be observed that a packing effect of the fibrils based on the decrease in volume is 40 per cent. If

[3] In tear, a line of rupture is established which is obviously the thickness of the sheet.

we predicate the increase in tensile strength in the occurrence of a greater number of fibrils per unit of cross section, this increase should not exceed that proportional to the 40 per cent shrinkage factor. It is to be observed that the strength increases six times this factor or 244 per cent.

On the score of the hydration theory, something in addition to hydration must have occurred, as hydration can only be of significance in the wet state of the sheet, as the dried sheet cannot be accepted as a form of hydrated cellulose.

It is possible to produce a similar series of changes by the action of zinc chloride solutions on a sheet of waterleaf cotton paper. It may be explained that the zinc chloride has not changed the chemical nature of the cellulose. The copper number is unaltered, the viscosity is relatively little affected, and the cellulose content is not changed. The zinc chloride may be described as exerting a dispersing action on the cellulose, from which dispersion the cellulose is precipitated by dilution with water, chemically unchanged. In Table IV are tabulated the properties of raw paper and paper lightly and heavily treated with zinc chloride.

TABLE IV

	Time of treatment,			Sheet Characteristics					
Sheet	min.	$ZnCl_2$ conc. %	Temp., deg. F.	Thickness in.	Area, sq. in.	Wt., g.	Density	Tensile, ave.	Tear, ave.
F	0	..	...	.0085	520	5.8	.44	15	67
G	1	68	60	.0085	500	5.9	.55	21.1	80
H	1	71	120	.0075	363	6.0	.87	44.1	129

This sheet, through the progressive action of zinc chloride, went through a history similar to the effect of progressive beating. The density was almost doubled. The area was reduced by over 30%, and the tensile strength was increased by almost 200%.

The results obtained in both Tables III and IV can be explained by reference to the molecular structure of cellulose as previously outlined. The action of the beater, as well as the effect of the zinc chloride, is to open the fiber structure to expose the fibril and to break down the fibers whether by mechanical action or by the peptizing effect of zinc chloride solution. As a consequence, the area of exposed hydroxyl radicals is increased many times, and these hydroxyls then establish molecular bonds from fibril to fibril throughout the sheet, thereby establishing a continuous network over a surface, which we habitually think of as a discontinuous entanglement of cellulose fibers.

The diminution of volume and the increase in density attest to the development of contracting forces, which it seems could occur only because the structural elements of the sheet are brought within the radii of molecular attractions and are thereby drawn into molecular association with each other. That such associations approach the ultimate limit of molecular dimensions is attested by the fact, that the density of such sheets will reach a maximum of 1.53 which approaches the ultimate density of cellulose at 1.56. In extreme cases of similar treatment, tensile strengths of 18,000 to 20,000 lb. per sq. in. are attained as the ultimate tensile strength of the cellulose sheet. This compares favorably with tensile strength values of 20,000 to 25,000 lb. per sq. in. for substances such as cast iron, aluminum, and copper, where the structural forces are related to the elemental aspects of the molecular scheme of the material.

Hydration Theory

The hydration theory of beating and of sheet formation had its principal basis in the swelling of the fibers during the beating process to produce a slime after protracted beating. The swelling could be accounted for on the assumption of inbibition of water, as both capillary water and water associated to form compounds with the cellulose *(13)*. But the notion that a cellulose hydrate exists in the finished sheet of paper appears to be unsupportable.

That hydrate formation is a necessary step towards the establishment of molecular cohesive forces between micelles and fibrils seems probable. We may visualize the hydrated fiber as one consisting of networks of chain molecules enveloped by hydration layers. Adjacent layers will have zero interfacial tension and under the expanding forces that accompany swelling, will be brought into contact. The interface will then disappear to produce a continuous hydration layer between the molecules. Thus, in extreme cases the fibriller surfaces will disappear, and a continuous network of chain molecules whose meshes contain the water of hydration will be established.

The water should be visualized as playing a twofold role. The swelling produced by it presses the interfibril surfaces into close proximity, and the layers of water molecules along the outer surfaces permit them to *flow* together. Such a mechanism can be visualized at the boundaries between crystallites as well. One may then think of a continuous network of chain molecules forming a network, whose meshes contain the water of hydration.

On drying, the water passes from the meshes of this network, but the contractive force of surface tension will decrease the volume; and as the OH groups of neighboring fibrils are brought within the radius of molecular cohesive forces, the bonding with H_2O will be replaced by bonding between adjacent OH groups.

In this swollen and fibrillated state, the chain molecules will likewise be more labile, and under the influence of thermal agitation the fibrillar units will come within the proximity of molecular attraction between adjacent hydroxyl groups permitting bonds to be established.

Thus, a sheet of glassine cannot be thought of as a hydrate, but as a sheet in whose structure a network of cohesive bonds has been established along the surfaces of the fibrils.

An interesting experiment was devised to test this explanation. Two sheets such as Sheet E in Table III and Sheet H in Table IV were prepared, and

TABLE V

						Tensile		Tear	
Sheet	Paper freeness	Area, cm^2	Thickness, in.	Wt., g.	Density	MD	CD	MD	CD
						—lb./linear in.—			
1	Standard sheet	89.0	.0065	5.9	.46	13.5	13.0	80	71
2	Extracted sheet	83.8	.010	5.3	.26	.85	.87	14.5	13.0
3	Zinc chloride treatment	42.1	.175	18.6	.993	210	135	647	947
4	Extracted sheet	48.3	.205	18.9	.752	209	133	516	640

Sheets 1 and 2 were formed from stock beaten in a standard beater and molded in a sheet mold. They were formed at the same time and represent identical procedures excepting that Sheet 2 was extracted with alcohol and then benzene. Sheets 3 and 4 are from material that received identical treatment with zinc chloride, Sheet 4 being initially part of Sheet 3, but sheet 4 was subsequently extracted with alcohol and benzene.

while still wet they were extracted first with ethyl alcohol and then with benzol to replace the water of the wet sheet entirely. The properties of these sheets are compared with the properties of the parent sheets in Table V. It is to be observed that the effect of water *replacement* before drying is to revert to the properties of the water-leaf or lightly beaten sheet. The replacement of the water held in the sheet would obviously involve more than the substitution of the nonliquid compounds for the water. This substitution eliminates the association which produce the contraction of the sheet. As a consequence, the areas and the thickness are greater, and the density is less where the water interface has been eliminated. The marked reduction in tensile and tearing strength of the extracted paper sheet indicate how completely the cohesive bonds have been eliminated. Reduction of the tensile strength of the zinc chloride-treated sheet does not bear out the same contention. It may be that in a zinc chloride sheet the bonds have been previously established through the specific effect of the zinc chloride, and having been established there is no significant reduction in strength on displacement of the water interface. In this latter instance, the elimination of the water interface may have meant only a reduction in the forces due to surface tension which bring the fibrils into close proximity.

In a tensile test, all structural elements are strained at once. In a tear test, structural bonds, whether they are cohesive or atomic, are strained successively. Tear consists in rupturing bonds one at a time. Theoretically, therefore, the multiplication of cohesive bonds throughout the sheet should not increase the tearing strength. The increase that is observed is due to the fact that a time element enters in the tear test, and in the sheet of higher shrinkage more structural bonds are ruptured per unit of time.

Cohesion Due to Pressing

Our discussion of the subject has been limited to unsized paper. We are not prepared to state whether the presence of sizing, loading, or other noncellulosic materials would help or hinder the development of cohesive micellar bonds. Furthermore, the development of such bonds would not take place extensively in a lightly beaten absorptive sheet. Exploration of this question requires that investigation be made on a paper prepared from a heavily beaten slow pulp like Sheet E in Table III. During the pressing operation, particularly as the last part of the water leaves the sheet cohesive bonds begin to form. These are fully established in the driers. The effect of tension at these points should be to orient the fibril structures in the direction of the tension-machine direction. Thus, the 2-way character of the sheet, already established by the orientation of fibers on the machine wire, should be further emphasized.

H. DeWitt Smith *(14)* and Van Iterson *(15)* have shown that the orientation of cellulose crystallites in rayon fibers and in cellophane sheets is susceptible to modification by the application of external forces such as tension. In the paper sheet, if a continuous pattern of crystallites has been established by the development of cohesive bonds between fibrils, the paper sheet should similarly show the effect of tension applied during manufacture in orienting these crystallites.

Our opportunities to explore this question did not extend to the paper sheet as formed on the Fourdrinier wire and dried on the paper drier. Again we turned to the finished sheet of paper, treated with zinc chloride solutions which as already indicated fibrillates and disperses the cellulose fiber. The method of procedure is to pass a continuous web of paper through a bath of zinc chloride; and then after leaching out the chemical in water, to dry the sheet on conventional paper driers. The character of the sheet has changed from that of a soft waterleaf absorbent paper to the dense tinny character of a hard-beaten sheet.

In the laboratory it was possible to follow the effects of the tension on the wet and on the drying sheet. Tension of 125 g. per in. was applied to successive samples both to the cross- and the machine-directions as shown in Table VI.

TABLE VI

Direction of tension	Tensile strength, lb. per in.	
On wet sheet	MD	CD
None	56.7	36.3
Machine direction	60.1	35.7
Cross direction	56.5	38.0
On drying sheet		
Machine direction	59.6	33.5
Cross direction	55.7	38.1

The MD-CD conventions are observed because the paper was made on a Fourdrinier machine.

The results in Table VI show clearly that the strength is increased in the direction of the tension. This happens because the chain molecules are oriented by the tension in the direction of that tension and the proportion of primary valence linkages per unit of area are thereby increased, requiring a higher strength to break the sheet.

Fiber Orientation

This phenomenon was further investigated on the making machine. Two plies of paper were treated with zinc chloride and combined to form a single sheet approximately 0.010 in. thick. The results are given in Table VII. The driers were operated with maximum tension. Samples were taken in the wet state before and after tensions had been set up in the making process and at intervals off the driers. Drying was completed by free exposure to the air. Thus Sheets 1 and 2 were entirely air-dried, showing no influence of machine drying. Sheet 3 was partly machine-dried, and Sheet 4 was entirely machine-dried.

TABLE VII

Sheet	Tension	Tensile, lb. per sq. in. MD	Tensile, lb. per sq. in. CD	Tear MD	Tear CD	Density	Adhesion, lb. per in. of width	Shrinkage %
1	None	140	88	...	...	1.05	10	10
2	Moderate on wet fiber.	153	88	350	390	1.05	10	10
3	Moderate on drying fiber	172	90	332	400	1.11	9.75	7.5
4	Full tension, about 15 lb./in.	225	80	250	417	1.18	5	0

In Table VII the column marked "shrinkage" gives an indication of the tension under which the sheet was dried. In Sheet 4 the tension was sufficient to prevent normal shrinkage entirely. The effect witnessed in laboratory tests in Table VI is here in production magnified many times. The increase in MD tensile strength for Sheet 1 to the sheet of extreme tension is 60 per cent. The tear shows an actual decline along the axis of orientation. This is to be expected as it should require less force to tear a cohesive bond than a valence chain. It increases at right angles to the orientation as the valence chains are increased in that direction.

Meyer and Mark *(16)* have pointed out certain

consequences that must follow, when a relatively random arrangement of micelles or crystallites is replaced by orientation along a common axis. The orientation results in packing the crystallites closely. The densities should be correspondingly higher. We have found it so as indicated in the column marked "density." Furthermore, the random arrangement of crystallites or fibrils should promote more rapid water absorption than is experienced with crystallites packed in alinement. Figure 3 demonstrates that this also occurs. Adsorption was determined in this graph by the expansion of the sheet over definite time intervals of immersion in water.

In these instances we can see that the sheet reacts to stresses much as do the cellophane sheets of Van Iterson and the rayon fibers of Smith. The modification of strength characteristics strongly implies the disturbance of a structural network which can readily be ascribed to a network of crystallites.

It remains for us to examine the assumption, that the effect of zinc chloride on the cellulose fibers is comparable to the effect of tackle in beating the stock. That there is no chemical change has already been stated. A change in the physical state of the cellulose fibers has taken place without question in both instances.

As seen under the microscope, the action of the beater roll is to split the fibers and to fibrillate them further. Gradually, surface accumulations of nearly transparent areas appear, and the fibrils increase in thickness.

The behavior of the zinc chloride is typical swelling behavior. The entire fiber begins to swell. The wrappings of the fiber in part begin to unwind and in part slips into constricting belts. At times it is possible to follow the separation of the fiber into fibrils. But in this medium the peptizing action of the zinc chloride is an additional effect to those occurring in the beater, and the fibrils slowly disappear in the microscopic field.

In the experiments thus far cited, the action of both beater and zinc chloride is to fibrillate and swell the cellulose and probably, especially in the case of zinc chloride, dissolve surface incrustations. The effect of the zinc chloride on the fiber structure was not sufficient to destroy the pattern of fibers that make up the sheet.

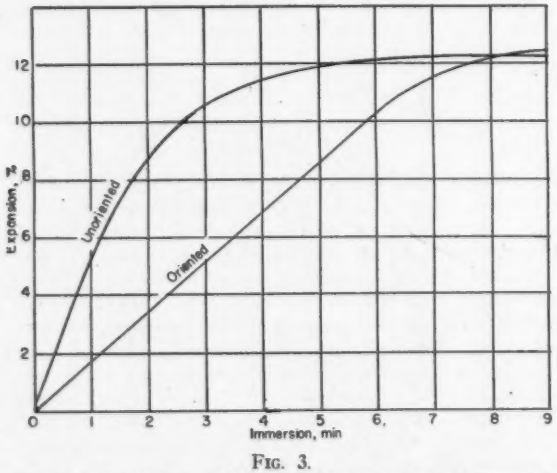

FIG. 3.
These Curves Give the Relative Rates of Cross-Direction Expansion of Two Sheets of Treated Paper.

Conclusions

We will then proceed to an examination of the suggestions which this series of investigations offers the papermaker to a better understanding of his objectives.

In the beating process we break down the fibers to fibrils and simultaneously dissolve pectic substances, pentosans, and any other cementing material which separates the fibrils from each other. Such treatment exposes the surfaces of the cellulose micelles which are studded with hydroxyl groups. In the subsequent operation of forming the sheet, these hydroxyl groups establish a continuous structure between fibrils through exercise of their residual attractive or cohesive force. This effect is slight with lightly beaten stock, but becomes progressively greater as the beating becomes more severe.

Molecular cohesion between these hydroxyl groups probably commences to establish itself on the felts, but does not get well under way until the sheet is taken onto the driers.

Tension at the draw and on the driers will serve to orient the fibrils and, therefore, the crystallites in the direction of the travel of the sheet. Such tension will serve to pack the crystallites and disturb a random and somewhat honeycomb structure. The consequence of this will be: (a) increased MD tensile strength; (b) decreased CD tensile strength and a relatively unbalanced sheet with more tendency to curl; (c) a sheet of higher density as a consequence of packing crystallites; (d) an improved resistance to moisture, greases, or vapors due to packing effect; (e) decreased uniformity in expansion, MD *vs.* CD, when exposed to moisture; and (f) the effect on folding character will be to reduce the fold across the sheet as a consequence of the more rigid internal structure which characterizes the oriented sheet. The reverse of this will result from the release of tensions at important points on the paper machine.

As previously stated, we have no information of the effect of sizes or fillers on these conditions. It seems probable that size would tend to intensify the effect.

A lightly beaten, highly absorbent sheet should show little indication of this phenomenon and the accompanying results. The more intensive the beating, the more cohesive bonds are formed, and consequently the more the crystallite network may be disturbed by exterior forces encountered in the manufacture of the sheet.

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Imports of Paper and Paper Making Stock

Giving Manifests of New York, Boston, Philadelphia and Other Ports of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard, Wallboard, Cigarette Papers, Sulphite, Kraft and Ground Wood Pulp.

Effective September 30, 1939, under Treasury Decision 49,970, all publications, exchanges and trade associations, were denied access to import manifests at the New York Customs House. The Paper Trade Journal and other interested parties have vigorously protested this ruling, and as soon as the order of the Treasury Department is modified or rescinded, full publication of all manifests will be resumed in these columns. In the interim, the Paper Trade Journal is making every possible effort to gather all available information from manifests, at various outside sources.

NEW YORK IMPORTS

WEEK ENDING JULY 20, 1940

SUMMARY

Cigarette paper .....354 cs.
Newsprint .....6,041 rolls.

CIGARETTE PAPER

National City Bank, *Exminster,* Barcelona, 76 cs.
——, *Exminster,* Barcelona, 209 cs.
Heemsoth Kerner Corp., *Exminster,* Barcelona 29 cs.
E. F. Pipe & Co., *Exminster,* Barcelona, 40 cs.

NEWSPRINT

——, ——, Liverpool, N.S., 5,717 rolls.
H. G. Craig Co., Inc., ——, Donnacona, 324 rolls.

RAGS, BAGGINGS, ETC.

Haroco & Co., ——, Shanghai, 13 bls. old rags.
Green Textile Associates, ——, Shanghai, 100 bls. cotton waste.
Padawer Co., ——, Shanghai, 50 bls. cotton waste.
Camden Fibre Mills, ——, Shanghai, 200 bls. cotton waste.
——, *Monterey,* Havana, 6 bls. 65 bags rags.
1st National Bank of Boston, ——, Sydney, 19 bls. rags.
1st National Bank of Boston, ——, Adelaide, 47 bls. rags, 11 bls. threads.

BOSTON IMPORTS

WEEK ENDING JULY 20, 1940

Chase National Bank, ——, Buenos Aires, 417 bags casein.

LOS ANGELES IMPORTS

WEEK ENDING JULY 20, 1940

——, *Tamerlane,* Tokyo, 1 cs. writing paper.

Mann-Frost Nuptials

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., July 22, 1940—Miss Dora Sherwood Foss, granddaughter of the late Governor and Mrs. Eugene N. Foss and daughter of Mr. and Mrs. Benjamin Sturtevant Foss was married in the Lyon Chapel of the First Parish Church in Brookline, Mass., Friday afternoon to William Frost Mann, a salesman for Baird & Bartlett Company, dealers in box boards. After September 1, Mr. and Mrs. Mann will live in Brookline. Mrs. Mann is a graduate of the Warrenton Country School. Mr. Mann was graduated from Harvard in 1930 and is a member of the Speakers, the Longwood Cricket Club and the Tennis and Badminton Club.

Brazil Buys More American Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., July 24, 1940—There is a good market for American paper in Brazil at the present time, obviously based on the adverse trade situation in Europe. Newsprint is one of the largest imported items. At the outset of the trouble in Europe there was an active interest on the part of local firms to establish connections with American suppliers, and while some local firms possibly have established solid commercial relations, others are still looking for possible American contacts.

In this connection it might be stated that Brazil possesses an important paper manufacturing industry which is devoted almost exclusively to the production of paper for books, letters, envelopes, cardboard, boxes, and similar uses. Imports of finished paper goods such as envelopes, letter paper, notebooks, loose leaf binders, etc., are not large and the imported articles are usually high grade fancy products not duplicated by the domestic industry.

Study Lasting Qualities of Fiber Board

As part of an extensive investigation of materials and structures for low-cost houses, the National Bureau of Standards, Department of Commerce, has been conducting studies of the relative lasting qualities for fiber insulating boards. Accelerated aging tests were used to produce, in a relatively short time, effects similar to those likely to arise from long periods of service.

In general, the retention under the aging treatments of the most essential properties of the boards—thermal conductivity and strength—was excellent.

It was found the fiber boards did not support the growth of rot-producing fungi except at relative humidities above 85 per cent. The growth of fungi at higher humidities was appreciably retarded by impregnating the boards with fungicides.

The accelerated aging consisted in subjecting samples of boards to wetting, drying, freezing and baking in relatively rapid succession, supplemented with outdoor exposures with frequent wetting.

Charged with Misrepresentation

WASHINGTON, D. C., July 24, 1940—Bilt-Rite Box Corporation, and its officers, Jacob Glekel and Jacob Press, New York, were charged in a Federal Trade Commission complaint with the dissemination of misleading representations in the sale of paper boxes.

According to the complaint, the respondents used the word "manufacturers" on letterheads, invoice and other printed matter, thereby representing that they manufacture the products they sell, when in truth they do not own, operate or control a plant, factory or machinery for the manufacture of their products. Twenty days are granted the respondents for filing answer to the alleged violation of the Federal Trade Commission Act.

Indianapolis Demand Steady

INDIANAPOLIS, Ind., July 22, 1940—A steady business continued to feature the local paper market the last week with all lines in demand and prices firmly held. The area got its first touch of summer during the week and seasonal merchandise jumped in volume.

Local jobbers say the demand for summer specialties is ahead of last year. One reason given for this is the 40-hour week in virtually all the industrials, which permits the entire Saturday and Sunday for vacation purposes. The fact that packaging of summer specialties has improved in appearance also has been an aid in their sales. Prices are only a shade higher than last year and are being held firmly.

Advance inquiries for school supplies were being received last week and orders should follow shortly. There is no reason to believe that the volume this year will be below that of last year.

Fine paper demand continued steady with all grades in demand. A fair volume of direct by mail advertising is being printed and information reaching local sources indicates that the fall demand for mail advertising will be considerably ahead of last year. Newsprint demand shows little change. Lineage is running about the same as it was a year ago, with foreign advertising holding up very well. Any slump in lineage appears to come from purely domestic advertisers.

Building and roofing paper demand continues to forge ahead and in many cases the only fly in the ointment is the fact that builders can not get materials fast enough to permit them to do the work they already have under contract. There is no shortage in paper or roofing, the shortage being in other materials.

Plan for Wrapping Paper Exhibit

The office of The National Paper Trade Association announces that the usual exhibit of wrapping papers, paper products, twines and kindred lines will be held in connection with its semi-annual covention this fall. The convention will be held in Chicago, Monday, Tuesday and Wednesday, September 23-25, with headquarters as usual at the Stevens Hotel. The fifth and sixth floors of the hotel will be occupied by exhibitors as heretofore.

Announcements presenting all necessary information with diagram of floor space, rates, etc., are being issued to manufacturers inviting them to participate and send their applications on the forms provided for that purpose. A large response is expected since the number of exhibitors at the annual convention in New York last February was the largest on record.

Before announcing this exhibit, the executive officers and exhibit committee of the association gave some thought to the uncertainties of the outlook from a manufacturing point of view as well as the effect on distribution of recent world developments and our own domestic problems. It was unanimously agreed, however, that "business as usual" and a forward looking policy should be adopted and encouraged in all branches of the trade. It was also felt that the opportunity for meeting customers, displaying products and discussing prospective conditions would be appreciated by manufacturers and welcomed by the merchants even more than in normal times.

Raise Flag at Rothschild

E. D. Stoetzel, director of Industrial Relations of the Marathon Paper Mills Company, Rothschild, Wis., writes: "Industry has been used as a whipping boy for the last eight years and unjustly accused in the past of unpatriotic practices, such as encouraging wars to make a profit and many other things, too lengthy to mention in this letter. We must, therefore, take steps to show that industry is conducted by just ordinary folks who have sons eligible for military service and do not want war anymore than other folks working in the mill.

"We have always had the flag out on patriotic holidays. However, since the June 15 News Letter of the National Association of Manufacturers, we have had the flag out every day. H. W. Prentis, Jr., president of the N.A.M., said in his last paragraph in that News Letter: 'Just as the flag has a definite place in every American manufacturing plant, alien doctrines and foreign isms have no place there. The flag, flying over your plant, will be a lasting call for eternal vigilance, both by employer and employee, in rooting out potential Fifth Columnists and saboteurs.'

"We needed a new flag pole at our Rothschild Division and used the completion of the new pole as an excuse for a simple flag raising ceremony in keeping with the times and cooperating with the spirit of Mr. Prentis' request.

"On Thursday, July 11, we had the Wausau W. P. A. band come to the mill and put on a program from 12:15 noon to 12:45. At that time John Stevens, Jr., our vice-president in charge of manufacturing, presented the flag to the boy scouts from our Rothschild troop (troop leader is Rex Oatman, one of our employees) and it was placed to the top accompanied by the Star Spangled Banner.

"We send you this article for publication if you see fit, to encourage other companies to do the same thing."

Buy Paper Under Walsh-Healey Act

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., July 24, 1940—During the week ended July 6, the Government purchased $99,908.28 worth of paper and allied products under the Walsh-Healey Act as follows: $35,452.58 worth of mimeograph paper for the Navy Department from R. P. Andrews Paper Company, Washington, D. C.; and $64,455.70 worth of toilet paper for the Navy Department from Bogart Paper Company, New York.

Government Paper Bids

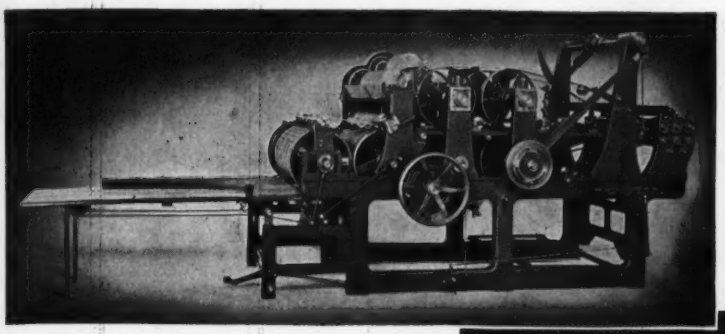
[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., July 24, 1940—Government Printing Office has received the following bids for 91 pounds (1750 sheets) of 21 x 32 pink sulphite gummed paper; R. P. Andrews Paper Company, $17.00 per M sheets; Whitaker Paper Company, $14.60; and Mudge Paper Company, $12.10.

To Represent Waterfalls Mills

The Waterfalls Paper Mills has appointed William Ellis Gay Southeastern representative with headquarters at 423 Citizens and Southern National Bank Building, Atlanta, Ga.

PAPER BAG MACHINERY . . .



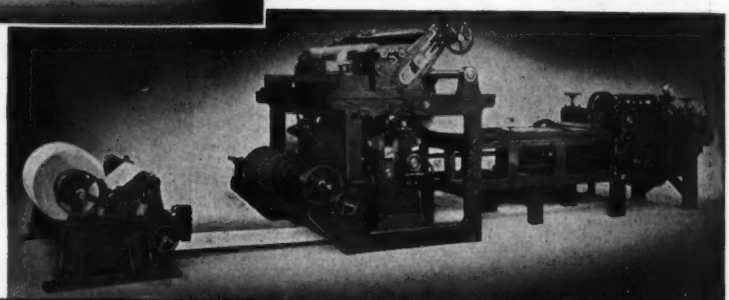
Machinery for flat, square, and satchel bottom bags. The famous tuber and bottomer for flour, cement, lime, and other heavy materials.

Heavy duty combination bottomer for valve or satchel bottoms.

←

Tuber for multiwall pasted bottom tubes with **Electric Eye** web control, keeping edge of paper in line for side seams and cross paster for bottoms.

→

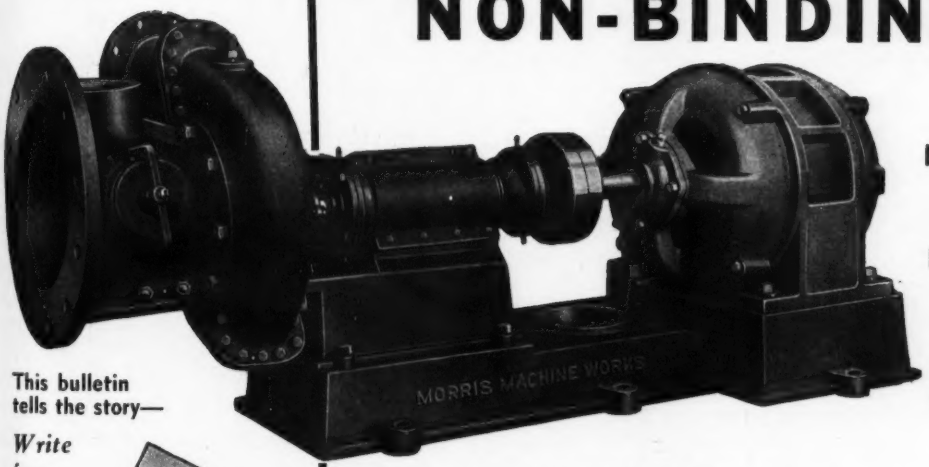


1828

The SMITH & WINCHESTER *Manufacturing Company*

SOUTH WINDHAM CONNECTICUT (2)

NON-BINDING....



and also

NON-CLOGGING

•

NON-WEDGING

•

NON-DEHYDRATING

This bulletin tells the story—

Write for your copy

OUR GUARANTEE—This Morris S T - P Stock Pump is **GUARANTEED** to handle raw waste paper stock, rag stock, or long-fibre stock without air binding or clogging. The design of this pump is based on 76 years of experience in building centrifugal pumps for every pulp and paper mill service.

Morris Machine Works, Baldwinsville, N. Y.

MORRIS ST-P STOCK PUMP

New York Paper and Pulp Market Review

Paper and Pulp Production Rises After Holiday Week Under Good Demand — Buying In Wholesale Market Off Slightly — Foreign Roofing Rags Nominal — Old Manila Rope Up — Higher Prices On Ledger.

Office of the PAPER TRADE JOURNAL,
Wednesday, July 24, 1940.

Demand for some grades of paper is reported at a little lower level in some quarters of the wholesale trade this week. Sales volume continues high, however, in many grades and the outlook for the near future is viewed in the trade as excellent.

The index of general business activity declined to 100.2 per cent for the week ended July 13, from 100.4 per cent for the preceding week, compared with 91.3 per cent for the corresponding period last year.

Paper production of 235 mills for the week ended July 13 was estimated at 93.0 per cent, compared with 78.8 per cent for 1939, with 75.7 per cent for 1938, with 87.6 per cent for 1937, and with 80.0 per cent for the corresponding week for 1936.

Paper board production for the week ended July 13 was 72.0 per cent, compared with 71.0 per cent for 1939, with 60.0 per cent for 1938, with 73.0 per cent for 1937, and with 71.0 per cent for the corresponding week for 1936.

A little decline in the volume of wholesale sales is indicated this week in reports received from many manufacturers' representatives, jobbers, and general paper merchants. Business continues good, however, with sales running from 10 to 12 per cent higher than last year in some lines. Kraft paper continues to reflect a strong market situation and export trade in this grade continues active. Prices on all grades of paper continue unchanged at prevailing market quotations.

The apparent total consumption of newsprint of all domestic publishers was 312,599 tons for June, an increase of 7.7 per cent over the like month last year. During the six months, there was an increase of 7.0 per cent above the same period last year. Advertising linage of newspapers decreased 1.7 per cent from June 1939, compared with an increase of 6.7 per cent for May.

Mechanical Pulp

No important change in the market situation in mechanical pulp has been reported this week. Prices continue unchanged at prevailing market levels on domestic and Canadian groundwood pulp.

Chemical Pulp

Chemical pulp prices remain firm, with no important change in prices on any grade of Canadian or domestic pulp reported during the week. Anxiety continues to prevail among some manufacturers regarding the growing scarcity of good grades of unbleached pulp and good grades of kraft pulp are also rather scarce.

Rags

Mill buying in the domestic rag market is reported as rather limited at this date. Demand for roofing rags is a little improved. No important changes in prices on any grade of new and old rags has been reported this week.

Old Rope and Bagging

The old rope market is stronger in tone at this date, with prices very firm. Quotations on old Manila rope have been advanced this week, foreign now being quoted at from 4.75 to 5.00, and domestic Manila at from 4.50 to 4.75.

The old bagging market is reported rather soft, with prices holding unchanged. Quotations at this date on foreign gunny are nominal.

Old Waste Paper

The paper stock market is reported rather soft at this date, with all prices holding unchanged, with the exception of higher prices on white ledger stock, currently quoted at from 2.15 to 2.25.

Twine

The market situation in twine continues favorable, with prices firm and unchanged. The trend on imported fiber twines continues upward because of the difficult and uncertain state of foreign trade. More active trading is expected in the trade the latter part of next month.

Philadelphia Strike Ends

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., July 22, 1940—The 19-day old strike of some 1,000 Philadelphia paper-mill workers ended on Friday last in a sudden compromise between owners of the 19 struck firms and Local 286 of the Pulp, Sulphite and Paper Mill Workers Union, AFL.

The strikers, who walked out over the employers' refusal to grant a flat 5-cent-an-hour wage increase during negotiations for a new contract, voted on Thursday in Ukrainian Hall to suggest an increase of 2½ cents to arbitration.

The acceptance of the plan was announced by Walter P. Miller, chairman of the Employers Committee, shortly thereafter. He said both sides had agreed on Dr. George Taylor, University of Pennsylvania economics professor, as the arbitrator.

Some of the strikers returned to work at once, but union leaders said most would not resume their jobs until today, when the union and the employers are expected to sign the compromise contract. The settlement was negotiated largely through the efforts of Charles Kutz, mediator for the State Department of Labor and Industry.

Groveton Paper Co. Doubles Sales

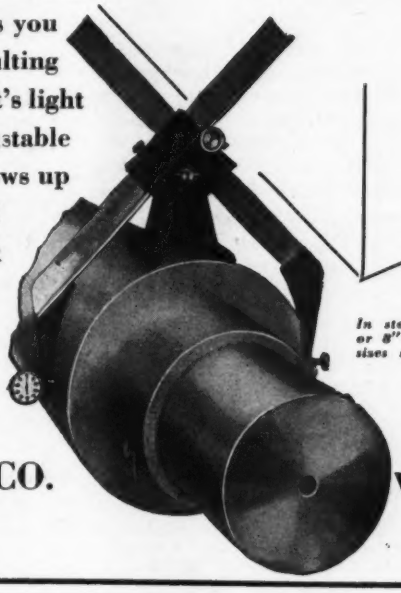
[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., July 22, 1940—Sales of the Groveton Paper Company, Inc., Groveton, N. H., for the first six months of 1940 are nearly double those of the same period for 1939.

Lobdell
MICROMETER
ROLL CALIPER

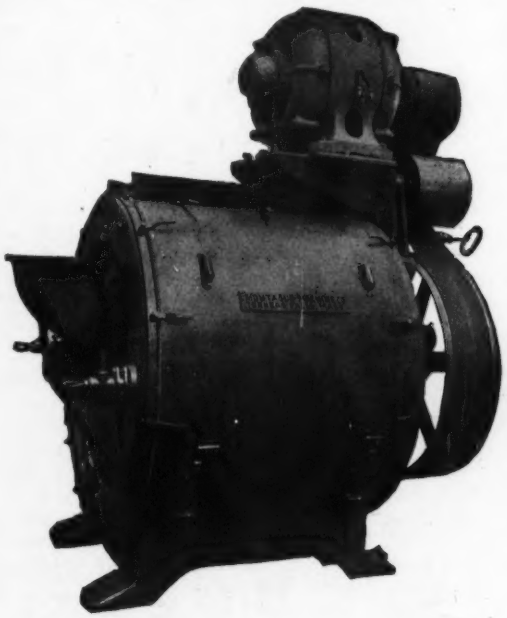
It protects you against unsuspected wear of calender and press rolls . . . insures you against rejects resulting from wear on rolls. It's light in weight, easy to use . . . quickly adjustable to a wide range of roll diameters. Shows up slightest wear before losses pile up! Nearly 100 paper mills use it; ask about it, today. Write—

PROTECTION AGAINST REJECTS
for about
69c
a day
!



In stock: for rolls 7" to 30" or 8" to 36" diameter. Larger sizes speedily made to order.

LOBDELL CAR WHEEL CO. **WILMINGTON • DEL.**



A Splendid Centrifugal Screen

For Sulphate
For Sulphite
For Groundwood

The Waterous Centrifugal Screen

Thoroughly modern to meet the needs of today and tomorrow.

Turbo design of Rotor—

In Ni-Resist for Sulphate
In Bronze for Sulphite
In Grey Iron or Bronze (as preferred) for Groundwood

Blueprints and Specifications of this splendid screen will be sent at your request.

Montague Machine Company
Turners Falls, Mass.

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, July 24, 1940.

BLANC FIXE—Prices on blanc fixe are firm and unchanged and conform to prevailing market levels. The pulp is currently quoted at $35 per ton, in barrels, at works; the powder is currently quoted at $50 per ton, f.o.b., works.

BLEACHING POWDER—Quotations on bleaching powder are firm. Demand reported moderate for the week. Bleaching powder is currently quoted at $2 per 100 pounds, in drums, at works.

CASEIN—Prices on casein are firm and unchanged for the week. Standard domestic casein, 20-30 mesh, is currently quoted at from 13 to 14 cents per pound; 80-100 mesh, at from 13½ to 14½ cents per pound. All prices in bags, car lots. Argentina casein is currently offered at from 11 to 12 cents per pound. The current quotation of 15 cents per pound on French casein is nominal.

CAUSTIC SODA—Quotations on caustic soda are firm and continue unchanged at prevailing market prices. Demand continues moderate. Solid caustic soda is currently quoted at $2.30 per 100 pounds; flake and ground at $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—Prices on china clay are firm and conform to prevailing market levels. Domestic filler clay is currently quoted at from $7 to $15 per ton; coating clay at from $11 to $22 per ton, at mines. Imported clay is currently offered at from $13 to $25 per ton, ship side.

CHLORINE—Quotations on chlorine are firm and unchanged. Demand reported good for the week. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—The rosin market is in a rather confused state, due to changes in basis weight from 280 pounds, gross weight, to 100 pound units. "G" gum rosin is currently quoted at $1.25 per 100 pounds, in barrels, Savannah. "FF" wood rosin is currently quoted at $1.25 per 100 pounds, in barrels, New York. Seventy per cent gum rosin size is currently offered at $1.72 per 100 pounds, f.o.b., shipping point.

SALT CAKE—Prices on salt cake are firm and nominal. Demand good. Domestic salt cake is currently quoted at $17 per ton, in bulk; chrome cake at $16 per ton. All prices in car lots, f.o.b., shipping point. The quotation of $20 per ton on imported salt cake is nominal.

SODA ASH—Quotations on soda ash are firm and continue to conform to prevailing market levels. Demand reported moderate for the week. Prices on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Prices on corn starch are firm and continue unchanged at prevailing market levels. Pearl is currently quoted at $2.80 per 100 pounds; powdered starch at $2.90 per 100 pounds. All prices in bags, car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina are firm. Shipments reported steady on contracts. The commercial grades are currently quoted at $1.15; iron free at $1.60 per 100 pounds, All prices in bags, car lots, f.o.b., works.

SULPHUR—Prices on sulphur are firm and conform to prevailing market levels, Annual contracts are currently quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are quoted at $19 per ton.

TALC—Quotations on talc are firm and continue unchanged at prevailing market prices. Domestic talc is currently quoted at from $15 to $21 per ton, at mines. Quotations on imported talc are nominal.

MARKET QUOTATIONS

Paper

(Delivered New York)

News, per ton—			
Roll, contract	$50.00	@	—
Sheets	58.00	"	—
Kraft—per cwt.—Delivered Zone A			
Northern, Extra Quality	$5.25	@	$5.75
Superstandard	4.87½	"	5.25
Northern Standard Wrapping	4.37½	"	4.62½
Standard Wrapping	4.25	"	—
Tissues—Per Ream—Carlots			
White No. 1	.97½	"	—
White No. 1 M. G.	.95	"	—
White No. 1½	.80	"	—
White No. 2	.75	"	—
Anti-Tarnish M. G.	.80	"	—
Colored	.85	"	—
Kraft	.87½	"	—
Manila	.77½	"	—
Unbl. Toilet, 1 M.	3.75	"	—
Bleached Toilet	5.25	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.10	"	—
Bleached, Jr.	3.60	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	8.25	@	10.25
No. 1 Manila Wrapping, 35 lb.	5.25	"	—
No. 2 Manila Wrapping, 35 lb.	5.00	"	—
Boards, per ton—			
News	35.00	@	40.00
Chip	35.00	"	40.00
Sgl. Mla. I.I. Chip	55.00	"	57.00
White Pat. Coated	67.00	"	70.00
Kraft Liners	55.00	"	—
Binders Boards	73.00	"	80.00

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—
White, Assorted Items,
Delivered in Zone 1:

	Bonds		Ledgers	
100% Rag Ext. No. 1	$39.10 @	$46.00	$40.25 @	$47.25
100% Rag	31.05 "	36.50	32.20 "	37.75
85% Rag	.... "	....	29.90 "	35.00
75% Rag	23.60 "	27.75	24.75 "	29.00
65% Rag	.... "	....	21.65 "	26.25
50% Rag	17.55 "	21.50	18.70 "	22.75
25% Rag	14.65 "	17.75	15.80 "	19.25

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—
White, Assorted Items,
Delivered in Zone 1:

	Bonds		Ledgers	
No. 1	$8.95 @	$11.00	$10.10 @	$12.25
No. 2	8.05 "	9.75	9.25 "	11.25
No. 3	7.60 "	9.25	8.50 "	10.75
No. 4	7.30 "	9.00	8.50 "	10.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—
White, Cased Paper,
Delivered in Zone 1:

No. 1 Glossy Coated	$11.90	@	$13.50
No. 2 Glossy Coated	10.35	"	11.75
No. 3 Glossy Coated	9.55	"	11.00
No. 4 Glossy Coated	9.15	"	10.50
No. 1 Antique (watermarked)	8.35	"	9.50
No. 2 Offset	7.70	"	9.00
A Grade E. F.	7.50	"	8.75
A Grade S. & S. C.	7.75	"	9.00
B Grade E. F.	6.95	"	8.00
B Grade S. & S. C.	7.20	"	8.25
C Grade E. F.	6.65	"	7.75
C Grade S. & S. C.	6.90	"	8.00
D Grade E. F.	6.40	"	7.50
D Grade S. & S. C.	6.65	"	7.75

Ivory & India at $.50 cwt. extra.

Mechanical Pulp

(On Dock, Atlantic Ports

No. 1 Imported—			
Moist	Nominal		
Dry	Nominal		
(Delivered)			
No. 1 Domestic and Canadian	40.00	@	45.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Prime Bleached Sulphite	3.72½	@	4.50
Prime Qualities—			
Easy-Bleaching Sulphite	3.17½	"	3.75
Strong Unbleached Sulphite	3.17½	"	3.75
(On Dock, Atlantic Ports)			
Kraft Bleached	4.00	"	4.50
Kraft Light & Strong	3.50	"	3.75
Kraft No. 1	3.25	"	3.60
(F. o. b. Pulp Mill)			
Kraft Domestic and Canadian	3.25	"	3.60
(Delivered)			
Soda Bleached	2.90	"	3.30

Add 60 cents per short ton, dock charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	7.00	@	7.25
Silesias No. 1	4.60	"	4.75
New Unbleached	6.75	"	7.00
Blue Overall	4.50	"	4.75
Fancy	3.25	"	3.50
Washables	2.00	"	2.1
Mixed Khaki Cuttings	2.75	"	3.0
O. D. Khaki Cuttings	3.15	"	3.3

Old Rags

White, No. 1—			
Repacked	3.25	"	3.50
Miscellaneous	2.75	"	3.00
White, No. 2—			
Repacked	2.50	"	2.75
Miscellaneous	2.00	"	2.25
Thirds and Blues—			
Repacked	2.00	"	2.25
Miscellaneous	1.75	"	1.90
Roofing Rags—			
No. 1	1.10	"	1.15
No. 2	.85	"	.90
No. 3 (bagging)	.90	"	1.00
No. 4	.60	"	.65
No. 5A	.60	"	.65

Foreign Rags

All prices nominal

New Rags

New Dark Cuttings	2.25	@	2.4
New Mixed Cuttings	2.00	"	2.2
New Light Silesias	5.50	"	5.7
Light Flannelettes	5.50	"	5.7
New White Cuttings	7.00	"	7.2
New Light Oxford	4.00	"	4.2
New Light Prints	3.00	"	3.2

Old Rags

No. 1 White Linens	7.50	"	8.5
No. 2 White Linens	6.50	"	7.0
No. 3 White Linens	4.50	"	—

"NON-USERS ARE THE LOSERS"

TENAX FELTS

FINISH AND SPEED

YEAR IN—YEAR OUT

Check back through the past years. You'll be interested to note the number of papermills where father and son both have confidently put their stamp of approval on durable, quick-drying TENAX FELTS.

Not on hearsay,—not on chance—but on production tests and records right in their own papermills. They gladly give due credit to TENAX FELTS for satisfactory service; to us for continuous cooperation.

"Non-Users Are The Losers"

LOCKPORT FELT COMPANY

NEWFANE, N. Y.–U. S. A.

EXTRA The Ilth

HETEROPHYTES* INVADE PAPER MILLS

Fifth Column Activities Revealed

When slime forming organisms invade paper mills, there's no tramp, tramp, tramp of marching feet—these fifth column heterophytes pursue their subversive activities unseen, unnoticed—until accumulations of slime cause severe production losses!

Profits disappear when slime appears—you get stock losses, blinded wires, plugged felts, obstructed pipe lines and costly growths in recirculating systems. And profits disappear too when shipments are rejected as a result of slime spots or high bacterial count.

Don't wait until your mill is overrun by heterophytes . . . and slime wins out! Destroy slime forming organisms with chlorine and ammonia, controlled by W&T apparatus. Preparedness costs little—from 1½ to 10c per ton of product!

Send today for your copy of the new W&T reprint "Microbiological Control in Pulp and Paper Manufacture." It tells how you can combat the invasion of heterophytes by preparedness!

*Heterophyte: Any dependent organism which derives its sustenance from dead organic matter, or at the expense of some other living organism . . . as "parasite" which means literally, "eating at the table of another," or, as "slime forming micro-organisms" — uninvited guests which "eat at the table of the paper manufacturer."

P20

WALLACE & TIERNAN CO. Inc.

Manufacturers of Chlorine and Ammonia Control Apparatus

Newark, New Jersey — Branches in Principal Cities

Other Services: Automatic pH Control • Dry Chemical Feeders • Bleach Plant Equipment • Testing Instruments for Chlorine and pH

No. 4 White Linens.	2.25	@	3.25
No. 1 White Cotton.	4.25	"	4.75
No. 2 White Cotton.	3.25	"	3.75
No. 3 White Cotton.	2.50	"	3.00
No. 4 White Cotton.	1.90	"	2.20
Extra Light Prints..	2.00	"	2.40
Ord. Light Prints...	1.75	"	2.15
Med. Light Prints...	1.55	"	1.95
Dutch Blue Cottons.	2.25	"	2.50
French Blue Linens..	3.00	"	—
Checks and Blues...	2.00	"	—
Linsey Garments....	1.90	"	2.00
Dark Cottons.....	1.50	"	1.60
Old Shopperies.....	1.30	"	1.45
New Shopperies.....	1.45	"	1.50
French Blues.....	2.25	"	2.50

Old Rope and Bagging

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	2.75	@	3.00
Domestic	2.50	"	2.75
Wool Tares, light...	2.00	"	2.25
Wool Tares, heavy..	2.12½	"	2.25
Bright Bagging.....	2.25	"	2.50
Manila Rope—			
Foreign	4.75	"	5.00
Domestic	4.50	"	4.75
Jute Threads.....	2.62½	"	2.75
Sisal Strings.....	2.10	"	2.35
Mixed Strings.....	1.10	"	1.20

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	3.10	@	3.25
Ordinary Hard White No. 1....	2.25	@	2.50
Soft White No. 1..	1.80	"	1.90
Soft White Extra..	2.50	"	2.60
Flat Stock—			
Stitchless	1.10	"	1.25
Overissue Mag....	1.00	"	1.10
Solid Flat Book...	1.02½	"	1.07½
Crumbled No. 1...	.70	"	.75
Ledger White Stock.	2.15	"	2.25
Ledger Stock Colored	1.60	"	1.70
Manila—			
New Env. Cut....	1.70	"	1.80
New Cuttings.....	1.30	"	1.40
Old Kraft Machine Compressed bales..	1.75	"	1.85
News—			
No. 1 White News	1.75	"	1.90
Strictly Overissue.	.70	"	.75
Strictly Folded....	.60	"	.65
Corrugated	.72	"	.77½
No. 1 Mixed Paper..	.47½	"	.52½

Twines

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.19½	@	—
White Hemp.....	.19½	"	—
Fine Polished—			
Fine India.....	.24	"	—
Unpolished—			
Box	.15	"	—
Paper Makers.....	.15¾	"	—
Tube Rope.....	.17	"	—
Wall Paper.....	.16	"	—
Wrapping	.18¾	"	—
Soft Fiber Rope....	.16¾	"	—
Cotton	.21½	"	—

(Hard Fiber)

Medium Java.....	.20	"	—
Mex. Sisal.....	.17	"	—
Manila	.24¾	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f.o.b. Phila.)

Shirt Cuttings—			
New White No. 1.	.07¼	@	.07½
New White No. 2.	.04	"	.04½
Light Silesias.....	—	"	.04½
Silesias, No. 1....	—	"	.04½
Black Silesias, soft	—	"	.03¾
New Unbleached..	.05½	"	.06
Washable, No. 1..	—	"	.04
Blue Overall.....	.04½	"	.05
Cottons—According to grades—			
Washable No. 2....	—	"	.01¾
New Blue	—	"	.01¾
Fancy Percales....	—	"	.03
New Black Soft...	—	"	.04
New Light Seconds	.04½	"	.05
New Dark Seconds	—	"	1.55
Khaki Cuttings—			
No. 1 O. D.....	.03½	"	.03¾
No. 2 Mixed.....	.02½		.02¾
Corduroy	—	"	.03
New Canvas.....	.05½	"	.06
New Black Mixed.	—	"	.03

Domestic Rags (Old)

White No. 1—			
Repacked	3.25	@	3.75
Miscellaneous	2.50	"	2.75
Thirds and Blues—			
Miscellaneous	1.55	"	1.65
Repacked	1.75	"	2.00
Black Stockings (Export)	3.50	"	4.00
Roofing Stock—			
Foreign No. 1....Nominal			
Domestic No. 1...	.90	"	1.00
Domestic No. 2...	—	"	.80
Roofing Bagging..	—	"	.70

Bagging

(f.o.b. Phila.)

Gunny, No. 1—			
Foreign .....Nominal			
Domestic	2.25	@	2.75
Manila Rope.....	—	"	4.50
Sisal Rope.....	1.75	"	2.00
Mixed Rope.....	.75	"	1.00
Scrap—			
No. 1.....	2.50	"	2.75
No. 2.....	1.10	"	1.15
Wool Tares, heavy..	3.50	"	3.70
No. 1 New Light Burlap	3.00	"	3.50
New Burlap Cuttings	2.00	"	2.25

Old Papers

(f.o.b. Phila.)

Shavings—			
No. 1 Hard White	2.50	@	2.55
No. 2 Hard White	2.10	"	2.15
No. 1 Soft White	2.00	"	2.10
No. 2 Soft White	1.60	"	1.75
No. 1 Mixed.....	.90	"	1.00
Solid Ledger Stock..	1.90	"	2.00
Ledger Stock, white.	2.00	"	2.10
Ledger Stock, colored	1.50	"	1.60
No. 1 Books, heavy..	1.10	"	1.15
Manila Cuttings.....	1.90	"	1.95
Print Manila.....	.65	"	.70
Container Manila....	.55	"	.60
Kraft Paper.....	1.70	"	1.75
No. 1 Mixed Paper..	.40	"	.45
Straw Board Chip...	.40	"	.45
Binders Board Chip..	.40	"	.45
Corrugated Board....	.70	"	.75
Overissue News.....	.75	"	.80
Old Newspapers.....	.55	"	.60

BOSTON

Old Papers

(f.o.b. Boston)

Shavings—			
No. 1 Hard White	2.75	@	3.15
No. 1 Soft White	2.00	"	2.25
No. 2 Mixed.....	.75	"	.80
Solid Ledger Books..	1.50	"	1.75
Overissue Ledger Stock	1.75	"	2.00
Manila Ledgers	.85	"	.90
No. 1 Books, heavy..	1.10	"	1.25
No. 1 Books, light..	.65	"	.75
Crumpled Stitchless Book Stock.....	.55	"	.65
Manila Env. Cuttings	1.85	"	2.00
Manila Envelope Cuttings, extra quality	2.35	"	2.60
White Blank News..	1.40	@	1.50
No. 1 Kraft.....	1.40	@	1.50
Extra No. 1 Kraft...	1.60	"	1.90
Mixed Papers.....	.45	"	.50
Print Manila.....	.50	"	.55
Container Manila...	.60	"	.70
Old Newspapers.....	.50	"	.55
Paper Wool Strings..	.95	"	1.25
Overissue News.....	1.00	"	1.10
Box Board Chips....	.40	"	.45
Corrugated Boxes....	.55	"	.65
Kraft corrugated boxes	1.25	"	1.40
New Kraft Cuttings.	2.00	"	2.25
Screening Wrappers	.60	"	.70

Bagging

(f.o.b.Boston)

Gunny Bagging—			
Foreign	2.75	@	—
Domestic	2.25	"	2.50
Sisal Rope.....	2.25	"	2.50
Mixed Rope.....	.85	"	1.00
Transmission Rope—			
Foreign	2.50	"	2.60
Domestic	2.40	"	2.50
Soft Jute Rope.....	3.00	"	3.25
Manila Rope—			
Foreign	4.85	"	5.10
Jute Carpet Threads.	1.50	"	1.75
Gunny Bagging—			
Foreign	2.75	"	2.85
Domestic	2.25	"	2.50
Bleachery Burlap....	4.00	"	3.25
Scrap Burlap—			
Foreign	2.40	"	2.50
Domestic	2.50	"	—
Scrap Sisal.....	2.25	"	2.50
Scrap Sisal for Shredding	2.30	"	2.65
Wool Tares, Heavy..	2.40	"	2.50
New Burlap Cuttings	3.75	"	4.00
Aust. Wool Pouches..	3.00	"	3.15
Heavy baling bagging	2.25	"	2.40
Paper Mill Bagging..	1.75	"	2.00
No. 2 Bagging.....	.75	"	.80

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints.	—	@	.03
Fancy Percales....	.04	"	.04¼
New White No. 1.	.07½	"	.07¾
New Light Flannelettes	.05	"	.05¼
Canton Flannel, Bleached	.07	"	—
Silesias No. 1	.05	"	—
New Black Silesias..	3.20	"	3.25
Soft Unbleached...	.07	"	.07½
Blue Cheviots.....	.05	"	.05½
Fancy	.02	"	.02½
Washable	.02	"	.02½
Cottons—According to Grades—			
Blue Overalls.....	.04½	"	.03
New Black, Soft..	.03	"	.03¼
Khaki Cuttings.....	.03	"	—
O. D. Khaki.....	.03	"	.03¼
Corduroy	.02¾	"	.03
New Canvas.....	.06¾	"	.07¼
B. V. D. Cuttings...	.07	"	.07½

Domestic Rags (Old)

(F. o.b. Boston)

White No. 1—			
Repacked	2.75	"	3.75
Miscellaneous	2.40	"	2.60
White No. 2—			
Repacked	1.90	"	2.00
Miscellaneous	2.00	"	2.25
Twos and Blues.....	1.50	"	2.00
Old Blue Overalls ..	1.60	"	2.00
Thirds and Blues—			
Repacked	—	"	1.25
Miscellaneous	—	"	1.00
Black Stockings.....	3.50	"	4.00
Roofing Stock—			
No. 1.....	1.00	"	1.25
No. 2.....	—	"	1.10
No. 3.....	—	"	.90

Foreign Rags

(F. o. b. Boston)

Canvas	.04¼	@	—
Dark Cottons.....	(nominal)		
Dutch Blues.....	(nominal)		
New Checks and Blues	(nominal)		
Old Fustians.....	(nominal)		
Old Linsey Garments.	(nominal)		
New Silesias.....	(nominal)		

CHICAGO

Waste Paper

(f.o.b. Chicago)

Shavings—			
No. 1 White Envelope cuttings....	3.15	@	—
No. 1 Hard White	2.50	"	2.65
No. 1 Soft White.	2.00	"	2.20
Ledger and Writings	.85	"	.95
Solid Books.....	.95	"	1.10
Blanks	1.50	"	1.60
Krafts	1.40	"	1.50
New Kraft Cuts.....	1.60	"	1.75
Overissue News.....	1.00	"	1.10
Old Newspapers—			
No. 1 Folded News	.70	"	.80
No. 1 Mixed Paper	.40	"	.50
Roofing Stocks—			
No. 1.....	.95	@	1.00
No. 2.....	.85	"	.90

Sherman Paper Products Corp. Changes

The Sherman Paper Products Corporation, Newton Upper Falls, Mass., announces the promotion of E. W. Pitt from advertising manager to sales manager of the Display Division.

A newcomer in the manufacture of display materials, the Sherman Paper Products Corporation at the beginning of 1940 absorbed the Dennison line of corrugated display materials. National dealer coverage has been secured and reports indicate exceptional sales progress. Mr. Pitt is well known in display and packaging fields, has been active in association work.

Paul Thompson, formerly research director of the F. W. Prelle Company, Hartford, Conn., advertising agency, and at one time assistant research director of the Strathmore Paper Company, West Springfield, Mass., has joined the Sherman Paper Products Corporation to fill the position of advertising manager.

Certify CIO for River Rouge Plant

WASHINGTON, D. C., July 24, 1940—National Labor Relations Board has announced certification of Local Industrial Union, Local 1006, affiliated with the Congress of Industrial Organizations, as the sole collective bargaining agency selected by a majority of the production, maintenance and power house employees of Consolidated Paper Company's Plant No. 10, River Rouge, Mich.

Board action was based upon a secret ballot election held March 25, resulting in favor of the CIO union.